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THE EFFECT OF PRESCHOOL GROUP EXPERIENCE ON VARIOUS LANGUAGE AND SOCIAL SKILLS IN DISADVANTAGED CHILDREN. FINAL REPORT.
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FIFTY DISADVANTAGED CHILDREN, RANGING IN AGE FROM 33 TO 56 MONTHS, PARTICIPATED IN A 7-MONTH PRESCHOOL EDUCATIONAL PROGRAM DESIGNED TO IMPROVE THEIR LANGUAGE AND SOCIAL SKILLS. THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES, THE PEABODY PICTURE VOCABULARY TEST (FORM A), AND THE VANCE LANGUAGE SKILLS TEST MEASURED THE CHILDREN'S DEVELOPMENT IN LANGUAGE SKILLS, AND THE CAIN-LEVINE SOCIAL COMPETENCY SCALE MEASURED PREEXPERIMENTAL AND POSTEXPERIMENTAL SOCIAL COMPETENCY. RESULTS WERE ANALYZED BY T-TEST AND ANALYSIS OF VARIANCE AND WERE MATCHED AGAINST THOSE OF A COMPARABLE GROUP OF PRESCHOOLERS WHO HAD REMAINED AT HOME. IT WAS CONCLUDED THAT THE PRESCHOOL PROGRAM IN THIS STUDY WAS NOT EFFECTIVE IN INCREASING THE LANGUAGE SKILLS SCORES AND SOCIAL COMPETENCY SCORES OF 3-YEAR-OLD AND 4-YEAR-OLD DISADVANTAGED CHILDREN AS MEASURED BY TESTS ADMINISTERED AT THE END OF THE PROGRAM. CONTRARY TO PRESENT EDUCATIONAL THEORY, THE HOME AND NEIGHBORHOOD ENVIRONMENT APPEARS TO BE AS USEFUL AS A CAREFULLY PLANNED PRESCHOOL SITUATION IN DEVELOPING NECESSARY LANGUAGE AND SOCIAL SKILLS. FUTURE STUDIES MIGHT FOLLOW UP THE TWO GROUPS OF CHILDREN WHEN THEY REACH KINDERGARTEN TO SEE IF LATENT LEARNING TOOK PLACE DURING THE EXPERIMENTAL PERIOD. APPENDIXES INCLUDE COPIES OF THE TESTS USED IN THE STUDY. TABLES SHOW STATISTICAL METHODS. (MS)

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August 1967

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Barbara Jane Vance

August 1967

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CHAPTER I

INTRODUCTION

The education of the preschool child[1] is receiving greater emphasis today than ever before. The education of the culturally deprived or disadvantaged child is receiving particular emphasis because of claims that such children are deficient in language and social skills necessary to compete in the middle-class oriented kindergarten or first grade (Bereiter and Engelmann, 1966; Brunner, 1967; Corbin & Crosby, 1965; Deutsch, 1963a; OEO, 1965a, 1965b; Passow & Elliott, 1967; Riessman, 1962). Economically, educationally, and socially impoverished environments apparently fail to stimulate the development of these skills (Deutsch, 1964a). A crucial question then seems to be, "Does preschool group experience make a difference in breaking the cycle of poverty by stimulating the development of language and social skills?"

Environmental Influence

Education is based on the assumption that the environment influences the development of certain behaviors. The curriculum has been defined as the planned environment in the school to bring about desirable changes of behavior in students based on cultural values (Quillen, 1965). The influence of the environment is emphasized in extensive studies and analyses of the literature by Hunt (1961) and Bloom (1964).

---

[1] A child between the age of 2-1/2 and entrance into kindergarten or first grade.

The influence of early environment, particularly related to maternal deprivation, has been widely studied beginning with the pioneering studies of psychoanalytically-oriented researchers like Spitz (1945) and Goldfarb (1955) and those more interested in general intellectual differences like Skodak (1939), Skeels (1942, 1945) and Kirk (1958). Casler (1961) suggests in his review of the literature on maternal deprivation that apathy or extreme social attention-seeking are the major consequences of deprivation. Yarrow (1961, 1965) stresses the importance of distinguishing the separate forms of early experience, particularly relating to social, affective, and sensory stimulation. He does not assign an independent role to cognitive stimulation.

Preschool educators have traditionally declared the importance of the availability of a rich environment during the early years to accommodate to the innate growth bent of each child (Erikson, 1950; Gesell and Ilg, 1949). The role of the teacher seemed to consist mainly of making available to the children the necessary environmental stimulation to allow this innate growth to take place and of furnishing a climate of warmth and nurturance. Inasmuch as "structure" in the child's environment was considered inhibiting to the child's freedom to explore, the role of the preschool teacher as an instructor was de-emphasized. One of the arguments in favor of preschool education was the lack of "subject matter," considered to be the exclusive province of the public school. The preschool experience was seen as a preparation period for the "formal" education of the public school through free exploration and creative expression. It was felt that a preschool could make available in greater quality and variety than the home the necessary environmental stimuli.

However, when Russia launched Sputnik the preschools throughout the United States felt the impact of feverish, and often emotional, emphasis on basic subjects. Greater pressure was exerted on teachers of young children to cut out the "nonsense of play" and get on with the job of education. In the meantime a ground swell of studies and reviews of the literature concerning cognitive development in early childhood (e.g., Bruner, Olver, Greenfield, et al., 1966; Fowler, 1962, 1966; Sigel, 1964) were made popular by the now-classic statement of Bruner (1960) that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development." The influence of environment in the early years was taking a new turn.

Early environmental influences today are being stressed in the education of the culturally disadvantaged child (e.g., Bereiter & Engelmann, 1966; Bloom, Doris, & Hess, 1965; Brunner, 1967; Corbin & Crosby, 1965; Deutsch, 1963a, 1963b, 1964a, 1964b, 1965a, 1965b; Gray, Klaus, Miller, & Forrester, 1966; Riessman, 1962).

A major issue seems to be that of the variety of experience. According to Hunt (1961):

> The greater the variety of situations to which the child must accommodate his behavioral structures, the more differentiated and mobile they become. Thus, the more new things a child has seen and the more he has heard, the more things he is interested in seeing and hearing. Moreover, the more variation in reality with which he has coped, the greater is his capacity for coping (pp. 258-259).

Deutsch (1964a) then postulates that

> . . . a child from any circumstance who has been deprived of a substantial portion of the variety of stimuli to which he is maturationally capable of responding is likely to be deficient in the equipment required for school learning. This does not necessarily imply restriction in the quantity of stimulation; rather, it refers to a restriction in variety--i.e., restriction to only a segment of the spectrum of stimulation potentially available (pp. 253-254).

Deutsch maintains that the school is the most promising agency for providing environmental compensations. Inasmuch as intellectual and achievement differences between lower-class and middle-class children are smallest at the first-grade level, tending to increase through the elementary school years (Deutsch & Brown, 1964), he suggests that children be given pre-first-grade experience before there has been an accumulation of failure experiences and maladaptive behavior. At the three- to four-year-old level considerably less has to be compensated for than in the first grade. Emphasis is in the cognitive areas of learning because later job success is dependent on increasingly complex functions which, in turn, are dependent upon successful educational experience (Deutsch, 1965a). The development of language is basic to cognitive development.

Language Development in Preschool Children

Early studies, largely descriptive and correlational, measured mastery of language in terms of vocabulary size, sentence length, function of language, articulation, and qualitative analyses of language. These studies have been reviewed at length by McCarthy (1951). According to a recent review of the literature concerning language acquisition (Huttenlocher, 1965) attention has shifted to the development of syntax (e.g., Miller and Ervin, 1964; Brown and Fraser, 1964). These studies reveal a phenomenon in the early growth of language known as the development of "operators" or "pivots." These are high-frequency words around which other words are used (e.g., *see* dolly, *see* light). Gradual elaboration of kinds of words used and complexity of phrases and sentences seems to revolve around such key words. The child seems to abstract most of his meaningful words from adult speech (Brown, 1958; Brown and Bellugi, 1964) where content words that the mother has probably practiced with the child--such as saying "orange" and pairing it with the object--are incorporated into the child's linguistic pattern.

Studies by Kendler (1963) and Bruner (1964) indicate that the solutions to various problems of discrimination are enhanced by the child's ability to verbalize the solution. Gagné (1965) suggests that learning is speeded up by verbal stimuli.

Bruner (1966) and Deutsch (1965c) postulate that the major deficits of children in schools are linguistic. Recent reviews of the literature in language development (Raph, 1965) and learning disabilities and remediation in disadvantaged children (Grotberg, 1965) support Bruner and Deutsch. Unless certain basic language skills are mastered, more elaborate ones become increasingly out of reach of the child. This gap in time can be reinforced to irreversibility by a sense of defeat often experienced by children from the lower socio-economic classes of our society.

Children from the lower classes experience a qualitatively and quantitatively different verbal environment compared with their middle-class contemporaries (Bernstein, 1959, 1960; Deutsch, 1963a; Hess & Shipman, 1965). The lower-class home is not verbally oriented. While the environment may be a noisy one, there is a minimum of non-commanding conversation directed to the child and practice in auditory discrimination and feedback from adults correcting his enunciation, pronunciation, and grammar. This seems to be an ideal setting for the child to learn inattention. If a child learns early to be inattentive, this further diminishes incoming stimulation and, therefore, the general level of responsiveness. This lack of environmental stimulation can prevent the child from learning to correctly label his environment and to thus use appropriate words to relate, combine, and recombine various concrete and abstract components in describing, interpreting, and communicating his experiences and ideas. These skills are important for the child learning to read and to respond to verbal instruction in the classroom.

Postulating that the kind of verbal communication used in the home shapes the language and cognitive styles of children, Hess and Shipman (1965) conducted a study with 163 Negro mothers and their four-year-old children selected from four different social status levels. These social-status levels ranged from college-educated professional, executive, and managerial levels to unskilled or semiskilled occupational levels where the education did not go beyond elementary school. Situations were created for the mothers alone or between mothers and children together in order to gather data regarding the mothers' tendency to use abstract words, mothers' tendency to use complex syntactic structures, person vs. status-oriented control systems, level of abstraction used in perceiving and ordering objects in the environment, and maternal teaching styles. No cause-and-effect statements could be made about the results because the study did not include an experimental design involving random assignment, control subjects, and manipulation of variables. However, the striking differences between the performance of mothers from upper socioeconomic levels and those from lower socioeconomic levels would indicate some fruitful areas for experimental research in control of child behavior by adult language patterns. For example, if a consistent pattern of language based on restricted grammatical structure and rule of authority could be seen to cause compliant, non-reflective, impulsive verbal and motor behavior in children, techniques could be developed to teach children as well as parents more effective means of communication.

A study by Dawe (1942) attempted to assess the effect of individual and group training methods on the development of certain language and other mental skills of orphanage children who experienced generally dull environments. Eleven pairs of preschool and kindergarten children were matched on the basis of school group, sex, chronological age, mental age, and vocabulary test scores. All of the children attended daily preschool or kindergarten classes. Each child in the experimental group received an average of 50 hours of individual and group training by the investigator in 92 days extending over a seven-month period. The training revolved around understanding of words and concepts, looking at and discussing pictures, listening to poems and stories, and going on short excursions. Children were tested at the beginning and end of the study on the Stanford Binet, the Smith-Williams Vocabulary Test, a home living and a science information test, and the intelligibility and organization sections of the Little-Williams Language Achievement Scale. The older children were tested at the end of the study on the Van Wagenen Reading Readiness Tests. In addition, all children were observed during training on frequency of various kinds of responses to training. Results indicated significant differences in favor of the experimental group in almost all cases. However, this study violated assumptions for significance because of matching rather than random assignment. Results, therefore, cannot be construed as cause-and-effect relationships. Furthermore, the treatment objectives were stated in such general terms that it would be difficult to determine if the criterion tests measured the study objectives. The study, however, is an illustration of possible techniques which could be used in experimental analysis of language training of young children.

Ametjian (1965) attempted to study the influence on lower-class preschool children of a language curriculum based on specific behavioral goals. Using her own language instrument as the criterion measure of language skill development, the investigator found significant differences in favor of the children who had attended a full-day nursery school program over a six-month period. This study is experimentally well designed and executed, with children in the experimental and control groups assigned at random. The language instrument seems to measure each language goal with the possible exception of the goal to develop interest in books and stories. The instrument would be a better diagnostic instrument if it had more items in each language area. This study does provide evidence, however, that language skills in lower-class children can be influenced by preschool experience.

Intelligence measures have traditionally been used in the schools to predict a child's possibilities of success in formal education (Cronbach, 1960). Such measures, however, cannot be used as diagnostic instruments of individual competencies in specific areas because they tend to group different abilities into single categories (Kirk & McCarthy, 1961). Although strongly weighted with verbal abilities, the Stanford-Binet, for example, does not give a reliable measure of separate aspects of mentality (Cronbach, 1960). During the past decade psychologists and educators have recognized the need for language instruments which can pinpoint specific linguistic areas in children which may need remediation. Two standardized instruments that hold promise for behavioral diagnosis in language are the Illinois Test of Psycholinguistic Abilities (McCarthy & Kirk, 1961a) and the Peabody Picture Vocabulary Test (Dunn, 1959). Specific verbal ability tests are also being standardized by Deutsch and his associates (1965c) and should be available soon for use in a broader spectrum of the population.

Social Development in Preschool Children

One of the strongest arguments in favor of preschool education has been the availability of children of the same age in a supervised setting where social skills could be developed, such as playing together without hurting one another, sharing one's possessions, and learning to converse with one's age mates. In addition, the child in a preschool is exposed to an adult other than the parent.

A quick glance at the titles of articles in journals concerned with various areas of child psychology, child development, or early childhood education will reveal the large percentage dealing with some area of social development in young children. Hartup (1965) states that over half of the literature in child psychology published since 1958 alone is concerned with some aspect of social behavior.

Bruner (1966) points out that, at least in the early stages, the instructional process is essentially social, involving at least a teacher and a pupil; therefore, if the child is to cope with school he must gain a minimal mastery of social skills necessary for engaging in the instructional process. However, Bruner does not elaborate on these skills.

A review of research on teaching in the nursery school (Sears & Dowley, 1963) and a review of the effects of early group experience (Swift, 1964) describe a variety of studies concerning social development of young children in group settings. These studies seem to revolve largely around interpersonal behavior (e.g., solitary or parallel vs. cooperative play, dependence vs. independence, dominance vs. submission, self-assertion, ascendance). The behavioral range for each category seems quite broad. Furthermore, behaviors not often considered "social" in nature but necessary for satisfactory group living are usually overlooked in studies of social development. Some of these behaviors include hand washing, use of eating utensils, care of clothes, dressing or undressing. Levine (1960), in developing a scale to measure specific skills considered socially appropriate for young children, defined a concept of social development (social competence) in more inclusive terms.

> [Social competence is] the process by which the child attains particular skills which ultimately permit him to achieve self-sufficiency and increased social responsibility. The child's development of social competence will be reflected in the development of his manipulative or motor abilities, moving from

> other-directed to self-initiated behavior, and from self-oriented to other-oriented behavior (pp. 5-6).

Basing the development of a social competence instrument on this behavioral definition of social competence, Levine formulated the San Francisco Social Competency Scale. A revised version of this scale, which is completed by a parent or other adult well acquainted with a particular child, has been published as the Cain-Levine Social Competency Scale (Cain, Levine, & Elzey, 1963).

The methods and techniques of social learning theory have been used in recent studies to teach socially appropriate behavior to young children in preschool settings (Bandura & Walters, 1963; Vance, 1965). The principles of positive reinforcement and imitation or modeling seem to hold the greatest promise for teaching socially appropriate behavior to young children.

Systematic social reinforcement of socially appropriate behaviors in young children by their teachers has been studied recently at the University of Washington Laboratory Preschool (Baer, Harris, and Wolf, 1963; Harris, Wolf, and Baer, 1964). The program consists of determining the current reinforcement contingencies of each child exhibiting a prominent behavior problem such as aggressiveness, whining, isolate behavior, or little physical activity. Contingencies involving teacher-provided stimuli are then experimentally manipulated. The program begins with observation of each child manifesting a particular problem. Behavior in its natural setting is observed according to rate, duration, and intensity of occurrence. The stimulus situation as well as its consequences are noted. Consequences produced by teachers--such as attention, approval, disapproval, affection, and encouragement--are noted in particular. Observation of each child continues until a stable picture of response and consequences is developed. Often it is found that the child's undesirable behavior consistently produces positive consequences from the teacher, such as attention and approving behaviors. Teachers are then trained to reinforce, and thus strengthen, only the socially appropriate behavior and to ignore the unacceptable behavior. After the new reinforcement contingencies produce a stable rate of appropriate behavior in the child, the "former" contingencies are reinstated as a means of testing whether or not the previous behavior will return to its original strength and stability. If such does occur it can be assumed that the undesirable behavior is under the control of teacher reinforcement. The new contingencies are then reinstated until the socially appropriate behavior returns to a stable rate. The intense reinforcement program is gradually diminished but the inappropriate behavior is never again reinforced.

Applying the technique just described, Allen, Hart, Buell, Harris, and Wolf (1964) effectively reversed the isolate behavior of a four-year-old girl in the nursery school. Harris, Johnson, Kelly, and Wolf (1964), using the same technique, report substantially increased "on-feet" behavior of a three-year-old girl in nursery school who, at the beginning of her nursery school experience, spent most of her time crawling or sitting while her peers engaged in standing, walking, and running activities. The same procedures were also used by Hart, Allen, Buell, Harris, and Wolf (1964) to reduce the crying behavior of two preschool boys.

Although these studies at the University of Washington involve experiments with a limited number of children, the behavior changes noted in the individual children were dramatic and apparently enduring according to follow-up investigation over a period of several months in each case. The methods used were simple and fairly easily applied in group situations.

An economical technique for teaching specific socially appropriate motor and verbal skills seems to be social imitation or modeling.

In a study designed to test a theory of social imitation, Bandura and Huston (1961) divided a group of nursery school children at random into two groups, a non-reward group and a reward group. Each child in the _non-reward_ group was accompanied by a female model to an experimental room. The model instructed the child to play with the available toys. She then busied herself with some papers at a desk in the same room but away from the child's play. In the _reward_ group, a female model also accompanied each child to an experimental room but sat on the floor to play with the toys with the child, giving approval and attention and offering help when the child asked for it. Immediately following the play session the experimenter entered the room, instructing the model and child that they were to play a game which involved guessing in which of two boxes a picture sticker had been placed. The model always took her turn first, with the child watching from the starting point at the other end of the room. As the model approached the boxes she exhibited several novel verbal, motor, and aggressive responses totally irrelevant to the task. The model would then reach into the box (always the correct one), take out a sticker, and paste it on a pastoral scene on the wall. The child then took a turn and imitative responses were recorded. The children in the reward group imitated verbal and motor responses to a substantially higher degree than children in the non-reward group, although all children in both groups imitated the aggressive responses. It was also noted that children in the reward group imitated verbal and motor responses of the model outside the experimental room.

In a study of the generalization of imitative responses to new situations in which the model is absent (Bandura, Ross, and Ross, 1961), nursery school children were matched on the bases of sex and ratings of the frequency with which they expressed and inhibited aggressive behavior in the nursery school. In the aggressive model condition children were brought individually to an experimental room where construction materials had been provided for their use. In another corner within sight of the child a model had been provided with a large inflated doll, a mallet, and a tinker toy set. During this 10-minute session the model performed unique aggressive acts which could be counted as imitative if, in a later session without the model, the child produced the same behavior. In the non-aggressive model condition the model, in contrast to the previous situation, sat quietly in the corner opposite the child, playing with the tinker toys. After this first session each child in both conditions was mildly frustrated and then taken to a room where toys could be used in subdued or aggressive fashion. Each child spent 20 minutes in this room, during which time his behavior was observed and recorded according to frequency of response in imitative aggression, non-imitative aggression, and non-aggressive response classes. If imitative responses took place they could be attributed to the model situation inasmuch as the model behaviors were low probability behaviors without demonstration. Children exposed to aggressive models performed substantially more aggressive responses than did children exposed to a non-aggressive model.

These studies in imitation, experimentally well designed by the use of random assignment of subjects to experimental and control groups, have dealt with highly visible and novel behavior. The use of this social learning principle must include careful planning of the specific behavior desired in order that the modeling will be attractive to the child and will avoid the possibility of inadvertent learning of socially inappropriate behavior.

Educational Programming for the Preschool Child

Preschool programming presently places emphasis on the disadvantaged child in order to provide experiences which would prevent the widening beyond reach of the gap between these children and their more advantaged peers (C. Deutsch, 1965). Fowler (1966) and Robinson (1966) discuss the disadvantages inherent in the use of short-term studies involving preschool children. Such short-term research cannot specify the variety and volume of stimulation that a child cumulatively experiences. Long-term studies involving preschool children in groups, mostly from the lower classes, are presently in process (e.g., Baltimore City Public Schools, 1964; Bereiter & Engelmann, 1966; Deutsch, 1965c; Gray & Klaus, 1965; Weikart, Kamii, Radin, 1964). In general, these programs emphasize cognitive development, particularly language development.

The Baltimore City Public Schools project (1964) is designed as a follow-up study of disadvantaged four-year-olds who have attended preschool classes in the district. All the children in the study were selected from depressed areas surrounding each of four schools in the school district on the basis of the presence of three or more persistent problems related to cultural deprivation. Low income and limited education of parents were the most persistent problems. Children who were subject to chronic illness or physical impairments which could impede learning were rejected as possible subjects. Interested mothers of eligible children made applications to the program. The eligible children in each school area whose mothers had applied for the program were randomly assigned to experimental and control groups. A total of 35 children was assigned to each experimental and each control group at each of the four schools. A back-up group was also selected for attrition purposes. Guidelines in communication, quantitative relationships, art, literature, music, health, self-concept, and environment were developed to teach specific skills in each area. The teachers developed their own ways to teach these skills. Each experimental group had one head teacher, one teacher assistant, one teacher aide, and a volunteer. The preschool classes were held in each of the four schools. Two of the classes were full-day classes and two were half-day classes. The preschool groups were set up to be the focal points of several studies, including a health and medical study, the development of an activity log form, and a study of selected cognitive factors revolving around reflective and analytic tendencies. Criterion instruments apparently were teacher observations and samples of the children's work. It was not clear if the control children in this study attended preschool or remained at home during the experimental period. In addition, if the children in the "back-up" group were used to fill in vacancies of children who dropped out of the study, statistical assumptions for experimentation were violated. The specific goals of the preschool program seemed to be well planned but instruments to test these specific goals were lacking. The lack of controls, in spite of a good attempt at experimental design, seems to make any possible results of this long-term study spurious.

A study that has gained wide national attention because of its radical technique of teaching young children is one conducted by Bereiter and Engelmann (1966; Bereiter, Engelmann, Osborn & Reidford, 1966) at the Institute for Research on Exceptional Children at the University of Illinois. The basis of this project is the idea that early intervention, rather than the mere mimicking of good homes, should develop young children in the areas of greatest deficiency related to school success in order to overcome over a year's retardation by the time the child reaches first grade. The 15 children in the project are four-year-old siblings of older children having educational problems in elementary schools in a low income, almost totally Negro district. The children were selected as "most deprived" by teachers making home visits who then encouraged parents to agree to send their children to the special class. No control children were selected for the project. The children attend preschool daily for two hours. Three 20-minute sessions are devoted to language, arithmetic, and reading instruction. Children are divided into groups of four or five for the instructional sessions. There is a half-hour for snack and singing and a shorter period of relatively unstructured play. The instructional sessions are highly task-oriented around 16 specific goals. At the beginning of the project the children were pretested on several subtests of the Illinois Test of Psycholinguistic Abilities, scoring on the average over a year below age norms. After three months, the same subtests were administered again, revealing average gains of 13 months over the pretest. In addition, the children were tested on instruments developed to test specific skills in each of the outlined goals and are reported to be accomplishing the goals set up at the beginning of the program. The program is designed at present to find out "what works." However, because there are no control subjects and no use of random assignment, results will be impossible to interpret in terms of cause-and-effect relationships. The results on the ITPA cannot be attributed to the treatment because no control group from the same population is available. The project, however, is an illustration of possible ways of developing a very specialized curriculum for preschool children around specific goals and of testing the achievement of these goals with instruments specifically designed for the curriculum.

A preschool longitudinal study has been established in the Perry School District in Ypsilanti, Michigan (Weikart, Kamii, Radin, 1964), to assess longitudinal effects of a two-year preschool program designed to compensate for mental retardation associated with cultural deprivation. The morning preschool program began in the fall of 1962 with three-year-old and four-year-old Negro children diagnosed as culturally deprived and mentally retarded. Control and experimental groups were equated on the basis of mean cultural deprivation rating and mean Stanford-Binet IQ, together with sex ratio and percentage of working mothers. The curriculum emphasizes verbal stimulation and interaction, dramatic play, and field trips through structured group teaching and organized area teaching. Each year a new control and experimental three-year-old group are added to the program as the old preschool classes move into kindergarten and first-grade classes. The program will follow the control and experimental children through the elementary years. The Stanford-Binet, the Leiter International Performance Scale, the Peabody Picture Vocabulary Test, the Illinois Test of Psycholinguistic Abilities, the Gates Reading Readiness Tests, the Parental Attitude Research Instrument, and teacher ratings of pupil and parent behavior are used as criterion instruments to test the vague goal of "increased awareness of the world." In general, the pretest and posttest results at the end of the second year of the program reveal significant differences between the experimental and control groups at the end of the preschool years but no significant difference between experimental and control groups as the children complete kindergarten. Mean losses occur in scores of experimental children after the kindergarten year. The design of the experiment is inadequate because the experimental and control groups are matched rather than randomly assigned to the groups. The results, therefore, cannot be considered as cause-and-effect relationships. Size of classes is not reported, although the total number of subjects reported in each testing is quite small (between 8 and 10). The goals of the program seem much too broad, and it is questionable if the criterion measures, therefore, test the goals of the program.

A longitudinal summer preschool project for 60 Negro deprived children focusing on attitudes and aptitudes toward achievement is in process in a city of 25,000 in the Upper South (Klaus & Gray, 1965; Gray, Klaus, Miller, and Forrester, 1966). The children were selected who would enter first grade in 1964. The 60 subjects were randomly assigned to two experimental groups and one control group in 1962. In addition, a distal control group of 27 was selected in a similar city 60 miles away. Experimental Group I attended preschool in the summer of 1962 and had home visitor contacts once a week during the regular school year. Experimental Group II attended summer preschool in 1963 along with Experimental Group I. Both experimental groups then had home visitor contacts during the following school year. The control group had no preschool group experience but entered first grade in 1964 with the experimental groups. The distal control did the same thing. The criterion instruments are the Stanford-Binet (later the WISC because of Binet test saturation), the Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic abilities. All groups are tested at the beginning and end of the summer and each school year. Results on the Stanford-Binet and Peabody Picture Vocabulary Test after five testings show significant differences between the experimental and control groups, with experimental scores showing increases on posttests and control scores showing decreases. Significant differences were found in favor of the experimental groups after two testings on the Illinois Test of Psycholinguistic

Abilities, with the exception of motor encoding. The curriculum of this preschool project seems to be an example of careful and specific planning in terms of behavioral goals, with planned reinforcement as a major strength of the program. However, the criterion measures seem to measure only a small part of the curricular goals. For example, no measures are reported for persistence, delay of gratification, and achievement motivation. The program is only a summer preschool program, but the weekly home visitor plan during the regular school year is unique. The consistent pretesting in this program seems unnecessary and perhaps is a bias factor when children must repeat tests so often they become testwise. The distal-control concept is questionable because the children are not from the same population as the experimental and control children. They, therefore, cannot be included in the same statistical assumptions.

Martin Deutsch (1965c) and his colleagues at the Institute for Developmental Studies at New York Medical College have been conducting a massive longitudinal study with mostly Negro children from the lower socioeconomic class in New York City. Experimental and control groups of children are added each year to "enrichment" or regular preschool classes while those who attend preschool go on into either enriched or regular kindergarten, first-grade, and second-grade classes. The preschool treatment is evolving around goals generally related to self-concept and language development. The preschool classes each have approximately 17 children each with one head teacher and one teacher assistant for each class. No goals are specified in terms of specific behavior. Therefore, it is doubtful if the Stanford-Binet, the Peabody Picture Vocabulary Test, and the Columbia Mental Maturity Scale measure the program goals. Other measures now being developed and standardized at the Institute are administered to the children in the project, but results of these tests are not yet reported in the literature. Reported results indicate that children who continue in enriched classes maintain increases in scores while those children who do not continue in the enrichment program actually score lower on criterion tests. However, the description of the nature of selection of the children and their assignment to groups in various schools is vague. It appears that statistical assumptions have been violated in setting up the experimental and control groups. The "enrichment" program does not seem to be geared to specific behavioral goals. Even if statistical assumptions were not violated, cause-and-effect statements would be difficult to make on the basis of results because of the continuing renovation of the treatment program and contamination through a multiple series of simultaneous studies with the same subjects.

Implications from the Literature

The literature shows trends that indicate that language and social skills can be learned in a group setting. This seems especially true with preschool children from socially, educationally, and economically impoverished sectors of our society. The importance of the development of language and social skills in such children has been stressed.

These studies and analyses imply that it is necessary to carefully plan the environment of the preschool in order to provide the necessary stimuli for the development of such skills. This, in turn, suggests the planning of a curriculum which, by definition (Quillen, 1965), is the planned environment in the school to bring about desirable changes of behavior in students based on cultural values.

The design for a curriculum should include aims and specific objectives, selection and organization of content, patterns of learning and teaching, and a program of evaluation (Taba, 1962). A study is needed wherein the development of language and social skills is identified in terms of specific behavior change and evaluated by methods designed specifically to measure such desired skills. Instructional methods in such an experiment should be designed to facilitate the achievement of such goals in preschool children. If these stated criteria are used in experimental procedures with disadvantaged children it seems probable that more powerful evidence can be gathered to indicate whether or not preschool group experience makes a difference in breaking the cycle of poverty by stimulating the development of language and social skills.

CHAPTER II

STUDY DESIGN AND PROCEDURES

The general hypothesis to be tested in this study was that the language skills scores and social competency scores of disadvantaged three-year-old and four-year-old children attending a preschool educational program for seven months would be significantly higher than those of a comparable group who remained in the home environment during the same period of time. The criterion measures for the language skills were six subtests of the Illinois Test of Psycholinguistic Abilities, the Peabody Picture Vocabulary Test (Form A), and the Vance Language Skills Test (see Chapter III). The Cain-Levine Social Competency Scale was the criterion measure for social competency.

Background

In 1965 the California State Legislature, in Chapter 1248/65 (A.B. 1331, Unruh), authorized the State Department of Education to provide for a statewide system of preschool educational programs. These programs would serve preschool children certified for eligibility by county welfare departments. In August 1966 the application of Fremont Unified School District requesting funds for two such preschool classes for the 1966-67 school year was approved (Project No. 9125-66/67, California Office of Compensatory Education). The investigator was the supervisor of this preschool educational program in the school district.

Setting

Fremont Unified School District serves the entire community of Fremont, Alameda County, California. Fremont is a fairly new suburban community of 96 square miles incorporated in 1956 by the unification of the five communities of Centerville, Irvington, Mission San Jose, Niles, and Warm Springs in southern Alameda County. It is a commuter community, with 59 per cent of the chief wage earners employed in communities outside Fremont, Newark, and Union City, the three adjacent communities in the most southern part of Alameda County (State of California Special Census, 1966). Fremont is located 36 miles southeast of San Francisco on the east side of San Francisco Bay, 25 miles south of Oakland, and 15 miles northeast of San Jose. There are 38 elementary schools, 2 junior high schools and 4 high schools within Fremont Unified School District serving a population of 90,400 (Fremont, 1966). The population of the community is growing rapidly, with an expected population of 130,000 by 1970 and 225,000 by 1980 based on present growth figures (Fremont Chamber of Commerce, 1966).

Fremont completely surrounds the city of Newark, incorporated in 1955, which has a population of 23,404 (City of Newark Special Census, 1966). Newark is also a commuter community, with 83 per cent of the chief wage earners employed in communities outside of

Newark. There are 9 elementary schools, 2 intermediate schools (grades 6, 7, and 8), and one high school in Newark.

Selection and Composition of Sample

Children participating in this study were selected from families in both Newark and Fremont who were receiving Aid to Families with Dependent Children (AFDC) as of July 30, 1966. A total of 115 three-year-old and four-year-old children were identified in the two communities as eligible for the preschool educational program. In Fremont Unified School District and Newark Unified School District the cut-off date for school entrance is December 1. For example, a child must turn five on or before December 1 in order to enter kindergarten the preceding fall term. Therefore, the same cut-off date was used to identify the children eligible for this preschool educational project. As a result, the age range at the beginning of school in September could be 2-9 to 3-8 for the three-year-olds and 3-9 to 4-8 for the four-year-olds.

In August 1966 an application (Appendix A) and a letter (Appendix B) explaining the preschool educational program in Fremont Unified School District were sent to the mother of each eligible child in Newark and Fremont. A week after the letters were sent representatives of the school district called at the homes of the eligible children to answer questions from the mothers about the preschool program and to pick up the completed applications from those mothers who wanted their children to enter the program. The letter and the school representatives explained to the mothers that only two classes had been funded for the 1966-67 school year; therefore, the applicant children were to be selected for the classes strictly on a chance basis after all applications had been turned in to the office of the investigator.

A total of 57 applications were submitted for the program. The applications were divided into groups by sex and by age (i.e., all three-year-old boys, all four-year-old girls, etc.). Each group was arranged into alphabetical order and numbered in that order. Using a table of random numbers, the investigator randomly assigned each application in each group to one of the following three groups: Experimental Group I (Preschool class I), Experimental Group II (Preschool class II), or Control Group (Non-preschool group). The original sample assignment is described in Table 1.

TABLE 1

NUMBER OF CHILDREN IN ORIGINAL SAMPLE BY TREATMENT, SEX, AND AGE

Treatment	Boys			Girls			Both Sexes		
	Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	7	2	9	3	6	9	10	8	18
Exp. Gr. II	7	2	9	3	6	9	10	8	18
Control Gr.	7	4	11	3	7	10	10	11	21
Totals	21	8	29	9	19	28	30	27	57

A letter was sent to the mother of each applicant child informing her as to whether or not her child had been selected for the program. The letter to the mothers of the children selected for the experimental groups (preschool classes) contained enrollment information, the beginning date of school, and the date on which to expect a home visit from the child's teacher. At no time were the mothers of the children in the experimental and control groups informed that the program was part of an experimental research project.

Although race is not a variable in this study, it is important to point out that a large population of people with Spanish surnames lives in Fremont and Newark. Most of these people speak English. In general, the Spanish-American population is sprinkled throughout the two communities rather than living in subcultural clusters. Table 2 illustrates the racial backgrounds of the children in the experimental and control groups. Of the total sample, 24.6 per cent of the children were Spanish-American and 75.4 per cent Anglo-American. There were no Negro applicants. All children in the experimental and control groups spoke English and came from homes where English was the major spoken language.

A total of seven children, or 12.3 per cent of the total sample, dropped from the study before the end of the testing program in the Spring of 1967. Table 3 shows the attrition by treatment group, age, and sex. In Experimental Group I, one child was withdrawn before the beginning of school and two children were

TABLE 2

NUMBER OF SUBJECTS IN ORIGINAL SAMPLE BY RACIAL BACKGROUND

Treatment	Spanish-American			Anglo-American			Both Races		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Exp. Gr. I	2	2	4	7	7	14	9	9	18
Exp. Gr. II	0	2	2	8	8	16	8	10	18
Control Gr.	3	5	8	8	5	13	11	10	21
Totals	5	9	14	23	20	43	28	29	57

TABLE 3

NUMBER OF SUBJECTS DROPPED FROM THE STUDY BY TREATMENT, SEX, AND AGE

Treatment	Boys			Girls			Both Sexes		
	Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	2	0	2	0	1	1	2	1	3
Exp. Gr. II	1	0	1	0	0	0	1	0	1
Control Gr.	2	0	2	0	1	1	2	1	3
Totals	5	0	5	0	2	2	5	2	7

withdrawn before the end of the first month of school. In Experimental Group II one child moved out of the state before testing could be accomplished. One child in the control group moved out of the state. The other two children in the control group moved to nearby communities but their mothers refused permission for testing. These seven children reduced the total sample size from 57 to 50. Table 4 shows the final sample size by cell. This is the sample discussed in the remainder of the study. The ratio of boys and girls in each of the groups is almost equal. However, even though the ratio of three-year-olds to four-year-olds in the total sample is the same, the distribution of the ages within the same sex is unequal, there being twice as many three-year-old boys as four-year-old boys and almost twice as many four-year-old girls as three-year-old girls.

TABLE 4

NUMBER OF SUBJECTS IN FINAL SAMPLE
BY TREATMENT, SEX, AND AGE

Treatment	Boys			Girls			Both Sexes		
	Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	5	2	7	3	5	8	8	7	15
Exp. Gr. II	6	2	8	3	6	9	9	8	17
Control Group	5	4	9	3	6	9	8	10	18
Totals	16	8	24	9	17	26	25	25	50

At the beginning of the project the oldest child was 56 months old (4 years 10 months) and the youngest child was 33 months old (2 years 10 months), as shown in Table 5. This is a total range of 23 months (1 year 11 months). The mean age of the control group, as shown in Table 6, is slightly older than either of the experimental groups, with a difference of 2.8 months between Experimental Group I and the control group and a difference of 2.5 months between Experimental Group II and the control group.

A community breakdown of the total sample in Table 7 reveals 64 per cent of the children from Fremont and 36 per cent from Newark. No attempt was made to separate the sample by community inasmuch as the community differential was not one of the variables under consideration in this study. Experimental Groups I and II have the same number of children from Fremont (12 each) while the control group has only 8 children from Fremont. On the other hand, the control group has 10 children from Newark, compared to 3 in Experimental Group I and 5 in Experimental Group II.

Information on family background was gathered from each family at the beginning of the project in September 1966. This information has been summarized in Table 8.

Families receiving public assistance funds through Aid to Families with Dependent Children (AFDC) usually are single-parent families due to death, separation, or divorce, or households in which the father is disabled or unemployed. Therefore, it would be expected that a large percentage of the families of the children in

TABLE 5

CHRONOLOGICAL AGE DISTRIBUTION IN MONTHS OF SUBJECTS IN FINAL SAMPLE-- SEPTEMBER 1, 1966

No. of Months	Number of Subjects			
	Exp. Gr. I	Exp. Gr. II	Control Gr.	Total
33	0	1	0	1
34	2	0	0	2
35	0	1	0	1
36	0	3	0	3
37	2	0	2	4
38	1	0	1	2
39	1	1	1	3
40	0	0	0	0
41	0	0	0	0
42	0	0	1	1
43	3	1	3	7
44	0	2	1	3
45	0	1	0	1
46	3	1	0	4
47	0	0	2	2
48	0	0	1	1
49	0	3	1	4
50	1	2	1	4
51	1	1	0	2
52	0	0	1	1
53	0	0	1	1
54	0	0	1	1
55	0	0	0	0
56	1	0	1	2
Totals	15	17	18	50

TABLE 6

AGE MEANS AND MEDIANS IN MONTHS OF FINAL SAMPLE -- SEPTEMBER 1, 1966

Treatment	Mean	Median
Experimental Group I	42.9	43.0
Experimental Group II	43.2	44.0
Control Group	55.7	45.5
Total	44.0	44.0

TABLE 7

NUMBER OF SUBJECTS IN FINAL SAMPLE BY CITY, TREATMENT, SEX, AND AGE

Treat-ment	Boys			Girls			Both Sexes		
	Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
				Fremont					
Exp. Gr. I	4	2	6	2	4	6	6	6	12
Exp. Gr. II	2	2	4	3	5	8	5	7	12
Control Group	2	2	4	0	4	4	2	6	8
Totals	8	6	14	5	13	18	13	19	32
				Newark					
Exp. Gr. I	1	0	1	1	1	2	2	1	3
Exp. Gr. II	4	0	4	0	1	1	4	1	5
Control Group	3	2	5	3	2	5	6	4	10
Totals	8	2	10	4	4	8	12	5	18

TABLE 8

NUMBER OF SUBJECTS IN FINAL SAMPLE BY TREATMENT AND FAMILY BACKGROUND

Description	Exp. Gr. I	Exp. Gr. II	Control Gr.	Total
Parents:				
Living together	7	5	5	17
Divorced	4	7	9	20
Separated	4	5	3	12
Deceased	0	0	1	1
Education of Mother (45 mothers reporting):				
Grade 8	2	0	2	4
Grade 9	0	1	1	2
Grade 10	3	4	3	10
Grade 11	2	3	5	10
Grade 12	6	5	4	15
Grade 13	0	3	0	3
Grade 14	0	0	0	0
Grade 15	0	1	0	1
Siblings:				
Brothers	33	31	39	103
Sisters	14	27	31	72
Child's Previous Group Experience:				
Play groups	1	0	0	1
Sunday school	3	4	5	12
Nursery school	0	0	1	1
Other	0	0	2	2

this study would be fatherless families. Analysis of Table 8 shows parents living together in only 34 per cent of the families. Of the remaining 66 per cent, 40 per cent of the families had experienced divorce and 12 per cent of the mothers were separated from their husbands; one mother was deceased. With few exceptions the mothers were full-time homemakers.

Education of the 45 mothers who reported averaged 11.0 years across all groups. Experimental Group II had the highest average schooling (11.5) and the control group the lowest average (10.5). Experimental Group I had an average of 10.8 years. The average difference across groups was slight.

Of the 50 subjects in this study, 48 have other siblings in the home. All children in Experimental Group I have siblings, while 16 of the 17 subjects in Experimental Group II and 17 of the 18 subjects in the control group have siblings. Of the 175 siblings of the subjects in this study, 57 per cent are male and 41 per cent are female. Of the male siblings, Experimental Group I had 32 per cent, Experimental Group II, 30 per cent, and the control group, 38 per cent. The control group also had the largest percentage of female siblings, 43 per cent, while Experimental Group I had 19 per cent and Experimental Group I had 38 per cent of the female siblings. There is an average of 3.1 siblings for each child with siblings in Experimental Group I, an average of 3.6 in Experimental Group II, and an average of 4.1 in the control group.

Only 16 of the children in the study had had any kind of group experience before applying for the program, as indicated in Table 8. Half of these children were in the control group. These group experiences were inconsistent and short term.

Families on welfare are considered some of the most mobile in the population. An investigation of the number of moves made in the lifetime of each subject revealed an average of 2.2 moves per child. One child in the control group had moved 15 times in his short life; one child in Experimental Group II had moved 11 times; and one child in Experimental Group I had moved 9 times. In general, however, the families of the subjects in this study were quite stable in terms of length of residence. When moves were made, they were usually to other communities within the same county or in adjacent counties. Of the original sample, the families of two children moved to Oakland, one to Contra Costa County, one to Santa Clara County, one to Santa Rosa, and 2 moved out of the state.

Classrooms and Equipment

Durham (Experimental Group I) and Brier (Experimental Group II) elementary schools in Fremont Unified School District each had a kindergarten room available each afternoon for use as a classroom for this preschool educational project. Because it was necessary for the preschool classes to share classroom space, some limitations on room arrangements and equipment were necessary. Storage was the major challenge. Neither school had handy storage space available for large pieces of equipment such as tricycles, packing crates, climbing boards, wagons, water tables, wood benches, etc.

In the classrooms, kindergarten and preschool children shared already limited cubbies. Neither classroom had a piano. A small bathroom for boys and a small bathroom for girls were the only toilet facilities available for the children. Each room had only one small sink. The tables were slightly higher than the comfortable height for three-year-old and four-year-old children, as were the chairs. However, table space was plentiful and the number of chairs quite adequate for preschool purposes. Bulletin board space was shared by the two kindergarten and preschool classes in each school.

The equipment of each kindergarten was available for the preschool class, but materials and supplies were ordered separately for each group. This further aggravated the storage problem.

Each room was large, almost too large for a group of 18 preschool children. The Durham classroom provided a great deal of possibility for creativity in room arrangement, the Brier classroom considerably less. Space for hanging the art work of the children was plentiful at Durham but non-existent at Brier where a special "art line" was devised by the preschool teacher. Both classrooms were painted attractively in pastel colors.

Outdoor play space consisted of a large black-top area for wheel toys and ball play and a smaller tan-bark area for a slide and one or two pieces of climbing apparatus. Neither kindergarten was equipped with wheel toys such as wagons and tricycles. Swings were available in other play areas than those used by the kindergartens. There were no sand boxes.

Preschool educators have traditionally emphasized the importance of a wide variety of materials and equipment in the preschool to provide first-hand sensory experiences for preschool children in an environment of orderly sequence and easy accessibility. Head Start equipment and materials were available to the project from the summer 1966 Head Start program in the school district. These included books, records, puzzles, indoor wheel toys, playhouse equipment, puppets, manipulative table toys, dolls, doll clothes and dress-up clothes. Additional equipment for each class was ordered for this project to supplement that of kindergarten and Head Start. This included polaroid, still, and movie cameras for each classroom, with a year's supply of film and flash cubes; a tape recorder with a year's supply of tape; record player; additional records and books; musical instruments, including autoharp, tone blocks, tone bells, claves, finger cymbals, maracas, drum, guiro, smooth and serrated sticks, and wrist bells; additional housekeeping equipment; a sand table; a workbench with vise, hammers, saws, and drills; additional manipulative toys; tricycles; wagons; climbing boards; a hot-plate and electric fry pan; doll carriage; and a steel storage shed.

On January 11, 1967, the preschool class at Durham (Experimental Group I) moved to a kindergarten room at Norris elementary school. The room at Norris became available when the kindergarten class using that room moved to a new elementary school completed during the Christmas holidays. There was no kindergarten class sharing the Norris school room in the morning. Therefore, storage space was increased as was flexibility of room arrangement. The outdoor play space included a large lawn in addition to the usual black-top and tan-bark areas. Swings were available in the kindergarten play area.

Teachers

Project funds provided for one head teacher and one teacher aide in each preschool class. It was a district requirement that the head teacher hold a teaching credential. In spite of a wide search for applicants with both preschool training and experience and teaching credentials, none applied. The teachers selected for the program held elementary teaching credentials only. The head teacher of Experimental Group II had had wide experience in a variety of elementary grades. The head teacher of Experimental Group I had had considerably less experience and at one or two elementary grade levels only. The teacher aides had had some work experience with cooperative and private nursery schools when their own children were preschool age.

Daily teaching and curriculum workshop meetings were held during the morning hours of the week prior to beginning of classes. During these meetings the teachers and teacher aides were trained in every phase of the preschool project. Weekly in-service training sessions were held throughout the year. These workshop and in-service training sessions were conducted by the investigator. Morning observations at various preschool projects were scheduled periodically throughout the year for the teachers and teacher aides. In addition, both teacher aides attended college classes in preschool education at a nearby college one evening a week throughout the year.

Experimental Treatment

The experimental treatment was a seven-month half-day preschool educational program with special curriculum emphasis on the development of language and social skills.

The program started on September 6, 1966, and testing began April 13, 1967. During the first week of school the teachers and teacher aides visited the home of each child to receive from the mothers necessary enrollment information, and to discuss transportation arrangements and preschool curriculum for the coming year. These visits also provided an opportunity for the teachers to get acquainted with the children in their individual home settings.

During the second week of school children were introduced gradually to the group situation, inasmuch as most of the children had never had preschool group experience before. The first day children came in groups of four or five in each class and stayed for an hour. The second day the children came in groups of nine and stayed for about two hours. These same groups of nine were rotated the third day so that the children were meeting some new children while still participating in a small group. The fourth day all children came together for two hours only. On the fifth day all children in each class came together for the regular four-hour school day.

Classes met from twelve noon to four each afternoon. Two Volkswagen busses leased to the program were used alternately by the teachers and the teacher aides to pick up the children and take them home. The distance the children traveled daily to both schools was approximately equal. The first bus load of children arriving just before noon participated in special small group activities while the teacher or teacher aide picked up the second load of children. These special activities were saved for the second bus load of children later in the afternoon when the first group went home. These groups of children were rotated each month in order to give all children an equal chance to participate in the special activity at the beginning and at the end of the school day.

Both preschool classes followed the same daily schedule. This schedule was as follows:

12:00 - 12:30	Special activity--first bus load of children.
12:30 - 1:15	Self-selected indoor or outdoor activities (emphasis indoor play). Indoor--books, puzzles, painting easel, musical instruments, manipulative toys, records, blocks, house play, graphic arts, etc. Outdoor--tricycles, wagons, jungle gym, slide, ball play, woodworking, etc.
1:15 - 1:25	Put away toys, toilet, wash.
1:25 - 1:50	Story Music Conversation

1:50 - 2:15	Light lunch
2:15 - 2:35	Wash Rest
2:35 - 3:30	Self-selected indoor or outdoor activities (emphasis outdoor play).
3:30 - 4:00	Leave for home (first bus load). Special activity (second bus load).

The development of specific language and social skills was emphasized throughout the treatment period:

Language skills goals.--The following language skills were emphasized throughout the treatment period:

1. The ability to recognize and name objects, actions, and people.
2. The ability to recognize and name various sounds in the environment.
3. The ability to relate and classify words and ideas.
4. The ability to express ideas in gesture and in word.

Social competency goals.--The following social skills were emphasized throughout the treatment period:

1. The ability to carry out manipulative self-help skills (e.g., dressing, undressing, washing hands and face, brushing teeth, using eating utensils, setting and clearing the table, sweeping).
2. The ability for self-direction in socially desirable behavior (e.g., putting toys away, completing a task, toileting, hanging up clothes, initiating play).
3. The ability to engage in socially appropriate interpersonal relationships with other children and adults (e.g., sharing toys, returning borrowed property, answering the telephone or door, playing with others).

4. The ability to communicate verbally with other children and adults (e.g., developing clear and distinct speech, verbally indicating wishes, answering questions). This goal is closely related to language goal 4.

During the in-service training session each week the investigator presented the curriculum topic for emphasis the following week in preschool. The implementation of the specific language and social skills goals was woven into the fabric of each curriculum topic. Curriculum topics stressed throughout the year included the following:

1. The preschool--this included learning labels for materials and objects in the room, learning the proper storage place for toys and equipment and materials, learning which areas were appropriate for certain kinds of activities, learning how things worked (e.g., the record-player and the tape recorder), learning the appropriate sequence of activities in preschool.

2. The children--this included learning one's own name and where to store belongings, learning the names of the children and the teachers, and learning to notice and discuss unique factors about each individual in the preschool.

3. Families--this included learning who lived in each family, what families do, what a family is.

4. Homes--this included learning where each child lived, what each house looked like, what kinds of rooms make a home, different types of homes in the community.

5. Weather--this included learning to label different kinds of weather, what happens to plants, animals, and people in different kinds of weather.

6. Seasons--this included learning the names for the seasons, ways to tell the seasons, and what people and animals do in the various seasons.

7. Holidays--this included learning the names of various holidays and participating in and discussing the various activities unique to each holiday.

8. Food--this included learning the names of various kinds of foods, tasting a variety of foods, and preparing foods in a variety of forms.

9. The community--this included learning the location and kind of buildings, industries, parks, and highways in the community.

10. Community helpers--this included learning the names, places of work and activities of such service people as policemen, firemen, doctors, nurses, dentists, bakers, grocery men, mailmen, service station men, and school principals.

11. Transportation--this included learning the names of various kinds of transportation such as boats, airplanes, busses, trains, and automobiles, how they work, what they carry, where they are stored and repaired, and what it feels like to ride in them.

12. Music--this included learning to sing different songs, play and listen to different records, use various musical instruments, and different ways of making sound.

13. Growing things--this included learning the names of some common flowers, shrubs, and trees and planting and caring for various kinds of plants.

14. Animals--this included learning the names of various kinds of animals, where they live, how they live, how they help man.

Concepts of color, size, shape, number, texture, and spatial relationship were included where appropriate in the various curriculum topics.

The content of each curriculum topic was designed around specific, concrete, first-hand experiences for each child. Discussion of any concept or principle was always preceded or accompanied by some type of first-hand experience. For example, cows and milk were discussed only after the children had taken a trip to a dairy farm and had seen a cow milked and had tasted the milk. Then the children discussed what a cow looked like or felt like or how it smelled; what color the milk was, how it tasted, why people drink it cold, etc.

Each curriculum topic, in the planning stage, was broken down into major ideas concerning the topic, concepts to be learned under each major idea, and activities that could lead to the development of each concept. This follows Gagné's (1965) description of the conditions of learning. The following is an example of part of the development of the topic, "Food":

Topic: Food

Idea I: Food is what we eat.

Concepts: eating, fruit, vegetable, meat.

Activities:

1. Pantomime certain actions, such as washing hands, brushing teeth, combing hair, eating. Let children tell what each action is. Then let the children pantomime and guess what their actions are. Then discuss why people eat.

2. Present a combination of food and other items to children, such as an orange, a piece of bread, a leaf, a flower, a piece of chalk, a carrot. Name each one. Let children decide what we eat and what we don't eat. Talk about why we eat some things and why we don't eat other things.

3. Show pictures of items that are food items and pictures of items that are not food items. Name each picture or let children name each picture. Let children decide which pictures are food and which are not. Then have children choose which foods are vegetables, which are fruits, which are meat, which are other kinds of food. Discuss reasons why.

During the in-service training sessions teachers would not only plan the specific activities of the following week, but would also practice certain teaching techniques such as helping children make the transition from clean-up time to wash-up time and story, leading a discussion with a small group of children, telling a story, handling certain behavior problems, giving reinforcement in certain situations, and ignoring some inappropriate behaviors.

Each area of the preschool was included in each curriculum topic. "Pacers" were set up each day in each area to stimulate specific kinds of play. For example, when the doctor was scheduled to visit school, the housekeeping corner was transformed into a doctor's office with bandages, pill bottles, tongue depressors, bottles of medicine (punch), nurses caps and uniforms, doctor's uniforms and doctor kits. The beginning of a "hospital" was prepared in the block corner. Books and pictures about doctors and nurses were laid out on the book table. Pictures relating to the work of doctors and nurses were spread out on the art tables with plenty of paste and construction paper. Even the tricycles and wagons were turned into ambulances. Children were prepared for the visit by discussions at story time a day or two in advance of the doctor's visit. After the doctor made his visit, the children continued their "medical" dramatic play in the block corner, art corner, book corner, "doctor's office," etc.

The story and discussion time was the key area of the program. During this period each day the teachers and teacher aides structured verbal and other sensory activities which would build into each topic idea and concept and prepare the way for follow-up activities by the children in the other preschool areas such as block play, art play, housekeeping play, and outdoor play. Field trips and excursions also played an important part in the development of concepts and ideas.

Each head teacher prepared in advance a schedule for each day's activities, relating each activity to the concepts and ideas of the curriculum topic being emphasized. At the end of each day each head teacher then wrote a brief summary of what actually took place that day and her observations of what various children seemed to be learning or what children needed special help. These lesson plans and summaries were often used to provide examples for discussion and practice during in-service training sessions.

Parent involvement was considered an important part of the treatment to provide stimulus continuation in the home of the language and social competency goals developed in the preschool curriculum. This involvement was accomplished for parents of children in both experimental groups through (a) volunteer partici-pation of the mothers (and some fathers) in the preschool, as additional teacher aides; (b) twice-daily contact with each home as children were picked up and dropped off; (c) home visits by the teachers; (d) individual parent-teacher conferences; (e) once-a-month activities for all parents; and (f) parent participation on field trips. Parents of the children in the control group were not involved in any parent program related to the study until testing began.

Procedures for Obtaining the Data

Testing began on April 13, and ended May 16, 1967. Testing appointments were set up in random order to equalize effects of time and treatment during the testing. The children were tested in their own homes.

The total testing time for each child averaged approximately two hours on the three criterion instruments used with the children in the study, the Peabody Picture Vocabulary Test (PPVT), the Illinois Test of Psycholinguistic Abilities (ITPA), and the Vance Language Skills Test (VLST). Therefore, two testing appointments were set up for each child to maintain child interest in the tests or "games." During one of the testing sessions the mother or guardian completed the Cain-Levine Social Competency Scale (CLSCS).

The examiners were not informed that the children they were testing were involved in a study until all testing was completed. This was to prevent examiner bias in testing (Kintz, 1965: Rosenthal, 1963, 1965).

Criterion Instruments: Language

The Peabody Picture Vocabulary Test and various subtests of the Illinois Test of Psycholinguistic Ability and the Vance Language Skills Test were selected to test each of the four language goals stipulated in this study. Comprehension and production were the two language learning processes involved in each of the first three language goals. The fourth language goal dealt with the production process only. In this study comprehension is defined as appropriate choice of a pictured and verbally stated concept or idea from among several pictured stimuli as measured by the motor response of pointing. This is related to such terms as "passive" language (Stone and Church, 1957), "comprehension" (Raph, 1965; McNeill, 1966), "reception" (Deutsch, 1965c), "decoding" (Kirk & McCarthy, 1961b), and "perceptual recognition" (Potter, 1966) used throughout the literature on language and psycholinguistics. Production is defined as the performance of appropriate motor or verbal concepts or ideas, with or without visual stimuli, in response to auditory stimuli. This is related to "active" language (Stone and Church, 1957), "verbal responsiveness" (Raph, 1965), "expression" (Deutsch, 1965c), "encoding" (Kirk & McCarthy, 1961b), "competence" (Bruner, Olver, Greenfield, et al., 1966), and "performance" (McNeill, 1966) used in the literature. The processes of comprehension and production are observable behaviors, "parts of a theory of performance (McNeill, 1966)." A study of grammatical contrasts by Fraser, Bellugi, and Brown (1963) apparently is the only recent experimental study designed to compare differences between comprehension and production, although much theorizing about such differences exists in the literature (e.g., Smith and Miller, 1966).

The Illinois Test of Psycholinguistic Ability is a diagnostic test given individually to the child and consisting of nine subtests. Each subtest is designed to measure a specific language ability. The test was standardized on 50 randomly selected children at each six-month age level from 2-6 to 9-0 in Decatur, Illinois (McCarthy & Kirk, 1963). Six subtests of the ITPA were selected for use in this study inasmuch as they seemed to provide diagnostic information in two of the four language skills goals outlined in this project. These subtests are as follows:

1. Motor Encoding
2. Vocal Encoding
3. Visual Decoding
4. Auditory-Vocal Association
5. Visual-Motor Association
6. Auditory-Vocal Automatic

The Peabody Picture Vocabulary Test measures a child's hearing vocabulary. The instrument was standardized on 4,012 white children in and around Nashville, Tennessee, including 668 preschool children between the ages of 2-6 and 5-0. It was selected for use in this study because it appeared to give a diagnostic measure of the comprehension process in the first language goal.

The Vance Language Skills Test was developed by the investigator to supplement the diagnostic information provided by the two standardized language instruments used in this study (Illinois Test of Psycholinguistic Abilities and Peabody Picture Vocabulary Test). It consists of the following eight subtests designed to measure specific language abilities in each of the four language goals outlined in this study:

1. Labeling
2. Spatial Relations A
3. Environmental Sound Identification
4. Speech Sound Discrimination

5. Spatial Relations B
6. Environmental Sound Labeling
7. Percepts and Concepts
8. Language Structure and Content

This instrument will be discussed in detail in Chapter III.

The language subtests are briefly described as follows under each language goal in the program:

Language Goal No. 1: The ability to recognize and to name objects, actions and people.

PPVT--Peabody Picture Vocabulary Test, Form A (Comprehension)

Purpose: To determine the child's ability to recognize specific objects and actions.

Procedure: The child is presented a series of ink line drawings in groups of four. He is asked to point to one picture in each group of four that corresponds to a stimulus word denoting the object or action.

Example: Examiner says SUITCASE. The child points to a picture in a set of pictures containing a doll, a ball, a suitcase, and a chair.

VLST Subtest No. I--Labeling (based on stimulus words and pictures in Form B, Peabody Picture Vocabulary Test) (Performance)

Purpose: To determine the child's ability to attach labels to specific objects and actions.

Procedure: The child is presented an ink line pictorial stimulus, a noun or a verb. The examiner says TELL ME WHAT THIS IS or TELL ME WHAT THIS PERSON IS DOING. The child labels the pictured object.

Example: Individual pictures of nouns (e.g., a shirt, a lamp, a saddle) or verbs (e.g., a boy pulling a wagon, a girl sitting down) are presented to the child one by one for labeling.

Language Goal No. 2: The ability to recognize and to name various sounds in the environment.

VLST Subtest No. IV--Speech Sound Discrimination (after Templin, 1957) (Comprehension)

Purpose: To determine the child's ability to identify similarity and difference in acoustic value of familiar words which can be pictured.

Procedure: Pairs of ink line drawings of familiar objects whose names are words similar in pronunciation except for single sound elements (such as BOX and BLOCKS) are posted on a single card and presented to the child, one card at a time. The child points to the picture of the thing denoted by the word the examiner said.

Example: The examiner presents a card picturing "gum" and "drum" and says DRUM. The child points to his choice of the two pictures fitting the examiner's stimulus word.

VLST Subtest No. III--Environmental Sound Identification (Comprehension)

Purpose: To determine the child's ability to identify various common sounds in his environment.

Procedure: Familiar environmental sounds are played one at a time on a tape recorder. With each sound the child is presented four pictures. He is to point to the one that represents the sound he has just heard.

Example: The sound of a car horn is heard on the tape recorder. The child is presented with four pictures: a car, a bird, a whistle, a train. He is asked to point to the picture of the sound he just heard.

VLST Subtest No. VI--Environmental Sound Labeling (Performance)

Purpose: To determine the child's ability to label various common sounds in his environment.

Procedure: Familiar environmental sounds that differ from those in the previous test are played one at a time on the tape recorder. The child is asked to name each one after he has heard it.

Example: The sound of a telephone ringing is heard on the tape recorder. The child is asked to tell the name of the sound he just heard.

Language Goal No. 3: The ability to relate and to classify words and ideas.

VLST Subtest No. VII--Percepts and Concepts (Comprehension and Performance)

Purpose: To determine the child's ability to match two pictures when the basis is perceptual identity or conceptual similarity and to give a verbal explanation for the grouping.

Procedure: Sets of five 4" x 6" cards are placed on the table facing the child, one set at a time. He is asked to select two cards from each set that go together. He is then asked if they go together because they are "just exactly alike" or because they are "the same kind of thing."

Example: A set of cards contains pictures (ink line drawings) of an electric fan, an apple, an airplane, a duck, and an airplane (identical). The child can select both airplanes and state they go together because they are exactly alike.

VLST Subtest No. II--Spatial Relations A (Comprehension)

Purpose: To determine the child's ability to identify spatial placement of pictured objects in relation to other pictured objects.

Procedure: Sets of four 4" x 6" cards are presented to the child, one set at a time. Each set shows four different placements of a particular object in relation to another object. The child is asked to point to the card showing the stated placement of an object.

Example: Each picture in a set of pictures contains a ball and a box. Picture #1 shows a ball "on" the box. Picture #2 shows a ball "in" the box. Picture #3 shows a ball "at the side of" the box. Picture #4 shows a ball "behind" the box. The child is asked to find the picture of the ball ON the box.

ITPA--Visual Decoding (Comprehension)

Purpose: To determine the child's ability to comprehend perceptually-similar pictures.

Procedure: The child is shown a stimulus photograph, then a set of four comparison photographs (one of which is perceptually, rather than physically, similar to the stimulus picture). The child points to the perceptually-similar comparison picture.

Example: The examiner points to a page with a photograph of a shoe and says HERE IS A SHOE; then turns the page where a car, a pistol, a shoe, and a doll are pictured; says NOW FIND ONE HERE.

ITPA--Visual-Motor Association (Comprehension)

Purpose: To determine the child's ability to relate visual symbols either on a transitional basis (sock goes with shoe) or on a substitutional basis (boys and girls are people).

Procedure: The child is presented a page of photographs of three different objects, two of which are separated from the third by a line. The child must select from among other photographs the one that goes with the stimulus picture. The child points to his selection.

Example: The examiner says WHICH ONE OF THESE THINGS (pointing to hammer and sock) GOES WITH THIS (pointing to "shoe," which is separated from hammer and sock by a line).

VLST Subtest No. V--Spatial Relations B (Performance)

Purpose: To determine the child's ability to locate certain points in space with one object relative to another object.

Procedure: A box and a block are placed before the child. The child is then asked to place the block at a certain point in space (e.g., PUT THE BLOCK BEHIND THE BOX or PUT THE BLOCK UNDER THE BOX).

ITPA--Auditory-Vocal Association (Performance)

Purpose: To determine the child's ability to relate spoken words.

Procedure: The child is asked to complete a test statement by supplying an analogous word.

Example: The examiner says SOUP IS HOT; ICE CREAM IS _______. The child replies COLD.

ITPA--Auditory-Vocal Automatic (Performance)

Purpose: To sample the child's repertoire of grammatical rules.

Procedure: A sentence-completion technique is employed. The child's task is to complete each test statement with a common, inflected word.

Example: The examiner shows a page of photographs containing a single apple on one side of the page and two identical apples on the other side of the page. The examiner points to the single apple and says HERE IS AN APPLE, then points to the two apples on the other side of the page and says HERE ARE TWO _______. The child replies APPLES.

Language Goal No. 4: The ability to express ideas in gesture and in word.

VLST Subtest No. VIII--Language Structure and Content (Performance)

Purpose: To determine the child's grammatical and syntactical structure and expression through conversation and reaction to visual stimuli.

Procedure: The child is asked some questions by the Examiner which are open-ended. Then two photographs are presented to the child one at a time. He is asked to tell what he sees. The child's responses are recorded on a tape recorder.

ITPA--Vocal Encoding (Performance)

Purpose:	To determine the child's ability to express ideas in spoken words.
Procedure:	The child is presented with an object he cannot fail to recognize (e.g., a red rubber ball, a piece of chalk, a yellow cube block, a piece of plastic) and asked to TELL ME ABOUT THIS.

ITPA--Motor Encoding (Performance)

Purpose:	To determine the child's ability to express ideas by appropriate gestures.
Procedure:	The child is shown a picture of an object and asked by the examiner to SHOW ME WHAT YOU SHOULD DO WITH THIS.
Example:	The child is shown a picture of a pencil sharpener. Child goes through the motions of sharpening a pencil.

Criterion Instrument:
Social Competency

The Cain-Levine Social Competency Scale was developed to diagnose the degree of social competence in mentally retarded children. A previous form of the test, known as the San Francisco Social Competency Scale, was developed by Levine (1960) in his doctoral dissertation, not only to measure the effects of training on severely retarded children, but for use with children within the normal range of intelligence. However, the Cain-Levine Social Competency Scale, published at a later date (Cain, Levine, and Elzey, 1963) appears to have better items for behavioral analysis of social skills in young children. The Cain-Levine Social Competency Scale consists of 44 scaled items and has four subtests: Communication, Social Skills, Initiative, and Self-Help. These subtests measure the four social competency goals outlined for this project. A copy of the scale will be found in Appendix C.

CHAPTER III

VANCE LANGUAGE SKILLS TEST: DEVELOPMENT AND STANDARDIZATION

An examination of the literature concerning language tests designed for use with preschool children revealed two standardized measures, the Illinois Test of Psycholinguistic Abilities (Kirk & McCarthy, 1961) and the Peabody Picture Vocabulary Test (Dunn, 1959). Both instruments were designed as diagnostic instruments, the ITPA reportedly measuring at least nine different language abilities and the PPVT measuring a child's passive vocabulary. Either or both the ITPA and PPVT had been used extensively throughout the country to measure gains in various preschool programs (e.g., Gray & Klaus, 1965; Weikart, et al., 1964).

Several tests measuring diverse language learning abilities were in various stages of development. Templin (1957) had developed a speech sound discrimination test which seemingly was considered impractical for most language testing programs because of its length compared to the results it could promise. Deutsch and his associates (1965c; Institute for Developmental Studies, 1966) were in the midst of standardizing several language measures. Ametjian (1965), influenced by the work of Deutsch and his colleagues, had developed a language instrument to measure three language abilities in preschool children for her doctoral dissertation. A Preschool Inventory (Caldwell and Soule, 1965), rapidly developed for a testing program during the first summer of the Head Start program, purportedly measured several language skills.

The review of the language testing literature did not reveal enough satisfactory language criterion instruments to measure the language goals outlined by the investigator for a preschool educational program. Therefore, it was decided that a language instrument would be developed by the investigator that could measure the attainment of language goals in the preschool educational program not measured by the ITPA and PPVT. Several instruments cited in the literature were used as models for the subtests in the Vance Language Skills Test (VLST).

Subtest and Item Selection

Each of the first three language goals in the investigator's preschool program was designed to develop two observable learning processes within that goal, language comprehension and production. The fourth goal dealt with the production process only. The Peabody Picture Vocabulary Test seemed to be an adequate measure of the comprehension process in the first language goal. The ITPA appeared to have no subtest that would measure the productive process. Therefore, at least one subtest had to be developed to measure the production process in Language Goal No. 1.

The ITPA contained no subtest that would specifically measure either comprehension or production in Language Goal No. 2. Therefore, at least two subtests needed to be developed measuring environmental sounds.

Two subtests of the ITPA seemed to be comprehension measures under Language Goal No. 2, while two other subtests from the same instrument seemed to be production measures. However, these four subtests appeared to measure only a narrow range within this goal. Specifically, subtests needed to be developed measuring various kinds of concept development and spatial relationship.

The production-centered Language Goal No. 4 was partially measured by two subtests of the ITPA. However, further measures needed to be developed around the production of spontaneous speech.

The analysis of the standardized language measures available and the areas under each language goal that were lacking proper measuring instruments indicated that at least eight subtests needed to be developed to provide a broad but specific range of measurement for each language goal.

The selection of items for the various subtests was the next major problem. There were several criteria for item selection: (1) items must be within the realm of experience of a broad socioeconomic range of preschool children; (2) items must be stimulating to one or more of the senses; (3) items must sample a broad range of content within the subclass being measured; (4) items must be plentiful enough to provide success experience for each child and yet discriminate among children: (5) items must be as simple in detail as possible.

Item pools for each subtest were prepared by the investigator influenced by instruments in the literature and with the aid of preschool teachers and graduate students and faculty in early childhood education. From this pool those items which, at face value, seemed to most adequately serve the purpose of each subtest were put together in a preliminary form of each subtest. Pictures were drawn, recordings were made, and scoring sheets and a test manual were prepared. Score sheets for the preliminary test are in Appendix D.

Pretesting

The preliminary form of the Vance Language Skills Test, consisting of 10 subtests, was administered by the investigator to 15 children selected at random from three different preschool groups in the Child Laboratory at San Jose State College. One group of children was made up entirely of children whose families are on Aid to Families with Dependent Children (AFDC). The other two groups, consisting of children from a broad socioeconomic range, were primarily Head Start trainee centers. In addition, the preliminary test was given to three preschool children who lived in the investigator's local community. Tables 9 and 10 describe the pretesting sample.

TABLE 9

AGE RANGES AND AGE MEANS OF PRETEST SUBJECTS ON VLST PRELIMINARY FORM BY SEX
N = 18

Sex	Age Range	Mean Age
Boys	42 to 61 mos.	55.6 mos. (4 yrs. 8 mos.)
Girls	39 to 61 mos.	55.3 mos. (4 yrs. 7 mos.)

TABLE 10

RACIAL ORIGIN OF PRETEST SUBJECTS ON VLST PRELIMINARY FORM
N = 18

Racial Origin	Number
Anglo-American	7
Mexican-American	7
Negro	3
Oriental	1

Pretesting was necessary in order to investigate test administration factors and to determine which items could be eliminated from the test. The administration time for the preliminary test averaged two hours per child. It was necessary to eliminate enough items to reduce the test administration time to one hour.

After the 18 children had completed the preliminary tests, item analysis was performed on each item in each subtest. Item difficulty was defined as the percentage of those children succeeding on each item (Nunnally, 1959). Final subtest items were chosen with the average difficulty level near the middle of the possible score range.

The Criterion Instrument

The result of pretesting analysis was a criterion language test made up of eight subtests (see Appendix E). The subtest names, number of items, and range of scores are shown in Table 11.

TABLE 11

NUMBER OF ITEMS AND POSSIBLE RANGE OF SCORES FOR VLST SUBTESTS AND TOTAL SCORE

Subtest	No. of Items	Possible Score Range
I. Labeling	30	0 - 60
Verbs	(8)	(0 - 16)
Nouns	(22)	(0 - 44)
II. Spatial Relations A	5	0 - 5
III. Environmental Sound Ident.	11	0 - 11
IV. Speech Sound Discrimination	59	0 - 59
V. Spatial Relations B	10	0 - 10
VI. Environmental Sound Labeling	10	0 - 20
VII. Percepts and Concepts	10	0 - 30
Percepts	(10)	(0 - 10)
Concepts	(20)	(0 - 20)
Totals	135	0 - 195

The criterion instrument was administered to 50 three-year-old and four-year-old children in a preschool educational program supervised by the investigator. These tests were administered during April and May, 1967. The test scores of these 50 children were used to determine the reliability of the final test, the Vance Language Skills Test. The Spearman-Brown prophecy formula (corrected split-half method) was used to compute reliability data on the test as a whole and on the individual subtests. The number of subjects by age and by sex is shown in Table 12. A detailed discussion of each subtest follows.

TABLE 12

NUMBER OF SUBJECTS IN VLST RELIABILITY SAMPLE
BY SEX AND AGE

	Boys	Girls	Totals
Three-year-olds	16	9	25
Four-year-olds	8	17	25
Totals	24	26	50

Subtest No. I: Labeling.--The purpose of this subtest is to determine the child's ability to attach labels to specific objects. The examiner presents individual ink-line drawings to the child and asks the child to name the objects or actions one by one. This subtest was used to measure the production aspect of Language Goal No. 1.

It was originally planned to use the words in Templin's (1957) Sound Discrimination Test as the basis for the pictures and concepts used in this test. However, further examination of these words indicated that the domain of action and objects was not sampled broadly enough in the Templin test. It was then decided to use the stimulus words from the Peabody Picture Vocabulary Test, Form B, as the basis of the subtest, at the suggestion of Carl Bereiter.[1]

The standard procedure for administering Forms A and B of the Peabody Picture Vocabulary Test is to show the child a set of four distinct ink-line drawings and ask him to point to a particular drawing that matches a noun or verb that the examiner states verbally. For this labeling subtest a small pilot group of children were presented the pictures in Form B of the PPVT, as in standard procedure. However, contrary to standard procedure, the examiner would point to the picture representing the desired object or action and say to the child TELL ME WHAT THIS IS or TELL ME WHAT THIS BOY (or GIRL) IS DOING. After the test was administered in this way with several children it became apparent that four pictures on a single page were confusing to the children as they attempted to name the picture stimulus at which the examiner pointed. The preliminary testing form of this subtest, therefore, contained only the single picture stimuli for each desired action or object. The first 75 stimulus words on Form B of the PPVT were used for preliminary testing.

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[1] Personal communication.

It was arbitrarily decided to cut the final form of the subtest to 30 items. Children during the preliminary testing began to lose interest half-way through the preliminary items. In addition, it became apparent that the children, although appropriately naming objects or actions, were not using the stimulus words outlined in Form B of the PPVT. For example, children never said "cobweb" (Form B word), but occasionally said "spider web"; they never said "shears" (Form B word), but often said "scissors." When scoring the preliminary test forms, the synonym words were given the same credit as the words listed on the PPVT. But another phenomenon occurred which resulted finally in a 0-1-or-2-point system of scoring. Children often could not give the exact name of an object or action or would interpret the stimulus just a little "left of center." For example, some children could not say "necklace" but said "it's a thing that goes around your neck"; or would say "pounding" for "hammering." In other words, there seemed to be two kinds of concept development exhibited in terms of language labeling, specific and general. It did not seem wise to give zero scores on items to children who were on the right track along with children who did not even come close to the correct concept label. It was decided to give 2-point scores on individual items to children who named the specific concept, and one-point scores on individual items to children who named a more general form of the concept.

An average sixty-percent difficulty level, with two points for the correct answer on each item, was found for 30 items. These items were ordered in terms of difficulty, the easiest items at the beginning of the subtest and the most difficult items at the end of the subtest. There were 22 nouns and eight verbs represented in the final subtest.

The Labeling subtest of the VLST was scored for total score on verbs, total score on nouns, total score on one-point items, total score on two-point items, and grand total (obtained by adding either the verb and noun scores together or the one-point and two-point scores together). There was a possible total of 16 points on verbs, 44 points on nouns, 30 points on one-point items, 60 points on two-point items, and a possible grand total of 60 points. Mean scores by age and by sex in the reliability sample on the Labeling subtest are shown in Table 13.

The corrected split-half reliability on the total raw scores of the Labeling subtest, using two-point scores for the correct answer, was .76, and using one-point scores for the correct answer, .87. Similar reliability data were computed on verbs only and nouns only. The verb-only reliability was .72 on two-point scoring, .78 on one-point scoring. The nouns-only reliability was .71 on two-point scoring and .82 on one-point scoring.

TABLE 13

MEANS AND STANDARD DEVIATIONS ON
SUBTESTS I THROUGH VII, VLST

Subtest		Age		Sex		Total N = 50
		Age 3 N = 25	Age 4 N = 25	Boys N = 24	Girls N = 26	
I. Labeling						
Grand Total	M	26.8	33.9	30.8	30.0	30.4
	SD	10.27	6.08	9.35	9.01	9.09
Nouns	M	19.6	23.4	22.0	21.0	21.5
	SD	6.86	4.10	5.86	6.03	5.92
Verbs	M	7.2	10.5	8.8	9.0	8.9
	SD	3.90	2.60	4.12	3.29	3.67
2-pt. scores	M	21.5	27.4	24.8	24.2	24.5
	SD	8.72	6.18	8.17	8.10	8.06
1-pt. scores	M	5.3	6.5	6.0	5.8	5.9
	SD	2.23	2.02	2.22	2.20	2.19
II. Spatial Relations A	M	3.0	3.4	3.2	3.2	3.2
	SD	0.79	1.22	0.93	1.13	1.03
III. Environmental Sound Ident.	M	7.2	7.8	7.3	7.7	7.5
	SD	1.90	1.92	1.76	2.06	1.91
IV. Speech Sound Discrimination	M	48.4	50.5	50.0	49.0	49.5
	SD	6.78	4.81	5.01	6.71	5.92
V. Spatial Relations B	M	5.5	6.4	5.9	6.0	5.9
	SD	2.06	2.10	1.94	2.28	2.11
VI. Environmental Sound Labeling						
Grand Total	M	7.0	9.0	8.2	7.8	8.0
	SD	4.20	3.86	4.11	4.17	4.11
2-pt. scores	M	5.4	6.6	6.2	5.9	6.0
	SD	3.34	3.40	3.28	3.55	3.39
1-pt. scores	M	1.6	2.3	2.0	1.9	1.96
	SD	1.12	1.11	1.06	1.26	1.16

TABLE 13--continued

Subtest		Age		Sex		Total N = 50
		Age 3 N = 25	Age 4 N = 25	Boys N = 24	Girls N = 26	
VII. Percepts and Concepts						
Picture-Choice	M	5.6	8.1	7.0	6.7	6.9
	SD	3.15	2.37	2.96	3.16	3.04
Exactly Alike 2-pts.	M	2.2	4.2	3.4	2.9	3.2
	SD	2.94	3.16	3.26	3.16	3.18
Exactly Alike 1-pt.	M	0.36	1.28	0.71	0.92	0.8
	SD	0.64	1.51	1.00	1.44	1.24
Same Kind of Thing--2-pts.	M	2.6	4.6	3.3	3.8	3.6
	SD	2.74	3.77	3.52	3.36	3.41
Same Kind of Thing--1-pt.	M	1.24	1.68	1.17	1.73	1.46
	SD	1.45	1.38	1.24	1.54	1.42
Grand Total	M	11.9	19.8	15.6	16.1	15.9
	SD	7.95	8.00	8.86	8.99	8.84

Subtest No. II: Spatial Relations A.--The purpose of this subtest is to determine the child's ability to identify spatial placement of pictured objects in relation to other pictured objects. The examiner shows the child a set of four 4" x 6" ink line drawings showing four different spatial placements of a particular object in relation to another object. The child is asked to point to a card showing a specific placement of objects. This test was used as one of the comprehension measures under Language Goal No. 3 in the investigator's preschool educational program.

A pool of 25 possibilities for pictured spatial placement was examined by an artist and the investigator. From this pool of 25, 10 were selected as being the most adaptable to various kinds of spatial placement in simple ink-line drawing sets of four. The task of making two-dimensional representations of three-dimensional space was extremely difficult when clarity and distinct differentiation were required. For example, it was difficult to tell in some drawings if an object were behind another object or at the side of another object. The pretesting of the 10 selected items selected for the preliminary subtest seemed to verify this. The average difficulty level for the 10 preliminary spatial items was 44 per cent. The average difficulty level of the five items selected for the final subtest was 50 per cent.

The scoring on the final subtest was very simple. The child received a point for each correct choice or a possible five points total on this subtest. The mean scores of the 50 reliability subjects, by sex and by age, are reported in Table 13.

The corrected split-half reliability on the Spatial Relations A subtest of the VLST was only .28. However, consideration of such a low reliability must take into account the fact that the subtest consists of only five items. The combination of the two spatial relations subtests in the VLST (Spatial Relations A and Spatial Relations B) showed a corrected split-half reliability of .72.

Subtest No. V: Spatial Relations B.--The purpose of this subtest is to determine the child's ability to locate certain points in space with one object relative to another object. The materials consist of a one-inch square toy building block and a small, colorful box. The child is asked by the examiner to place the block in various positions relative to the box. This subtest was used as one of the production measures under Language Goal No. 3 in the investigator's preschool project.

The preliminary form of this subtest was influenced by some of the spatial relations items in The Preschool Inventory developed by Caldwell (Caldwell and Soule, 1965), and consisted of eight items. As pretesting continued, however, it became apparent to the investigator that the eight items in the preliminary form were not strictly spatial relations items only. Three toy cars and three boxes varying in size were used. The instruction PUT A CAR ON THE LITTLE BOX required not only knowledge of spatial relationship, but also knowledge of number and size. Different spatial relations instructions revolving around the same objects seemed to put less strain upon the memory to draw upon other concepts. Therefore, two simple objects easily handled by a young child were selected for the final subtest. The items were an attempt to cover a broad field of spatial relations relative to the two objects (e.g., on, at the side of, inside, in back of, in front of) as well as combinations of similar spatial relations (e.g., on top of vs. on, at the side of vs. beside).

The 10 items in the final subtest were socred on a very simple basis: The child received one point for each correct block placement. There was a possible score of 10 points. The mean scores of the 50 reliability sample children are shown in Table 13 by sex and by age.

Corrected split-half reliability on the VLST Spatial Relations B subtest was .68. Similar reliability computations were performed on the combination of Spatial Relations A and B subtests, as stated before, revealing a reliability coefficient of .72. The combined subtests produced a test of 15 items, rather than just five items for Spatial Relations A alone or 10 items for Spatial Relations B alone.

Subtest No. III: Environmental Sound Identification.--The purpose of this subtest is to determine the child's ability to identify various common sounds in his environment. Familiar environmental sounds are played on the tape recorder. With each sound the child is presented four ink-line drawings. He is asked to point to the picture of the sound he hears. This subtest was used to measure the production process in Language Goal No. 2 in the investigator's preschool educational program.

The preliminary subtest consisted of 20 environmental sounds (e.g., vacuum cleaner, typewriter, water pouring in sink) selected from those used in the Environmental Sounds-Picture Identification test used by Deutsch and his colleagues (Institute for Developmental Studies, 1966). A random selection of pictures representing three other sounds from the same test was used to accompany each criterion item sound picture. Therefore, each picture in each set of four pictures represented a sound that the child eventually heard on the tape recorder during the subtest.

After pretesting the 20-item preliminary subtest, the difficulty level for each item was computed. The average difficulty level was 80 per cent. The lowest eleven items, in terms of difficulty level, were selected for the final form of the subtest. The final subtest items had an average difficulty level of 67 per cent.

Each correct picture choice was worth one point, for a total of 11 points possible on this subtest.

The mean scores of the 50 subjects in the reliability sample are shown in Table 13. The corrected split-half reliability on the Environmental Sound Identification subtest was a very low .25.

Subtest No. VI: Environmental Sound Labeling.--The purpose of this subtest is to determine the child's ability to label various common sounds in his environment. Familiar environmental sounds differing from those in the Environmental Sound Identification subtest are played for the child one at a time. He is asked to name each sound. This subtest was used to measure the production process in Language Goal No. 2 in the preschool educational program supervised by the investigator.

The 19 items in the preliminary form of this subtest were largely based on sounds used in the Familiar Environmental Sound-Labeling subtest used by Deutsch and his associates (Institute for Developmental Studies, 1966). Some recorded sounds were not available fitting the Deutsch sounds, so a few modifications were made.

After preliminary testing, an examination of the sound labels volunteered by the pretest children for each sound revealed a similar pattern to that found in the Labeling subtest. Some children identified the sounds specifically. However, many sounds were identified in more general terms (e.g., "telephone" for "telephone busy signal"). It was, therefore, decided to score each item on a 0-1-or-2-point basis, with the specific labels worth two points each and the general labels worth one point each.

The average difficulty level was computed after item analysis of the pretest items. This level was 60 per cent. It was necessary to shorten the subtest by about one-half to prevent boredom in the children and to include the subtest within the time limit of the whole test. Of the original 19 pretest items, 10 were selected for the final subtest. These 10 items had an average difficulty level of 50 per cent.

The test was scored in terms of total one-point scores, total two-point scores, and grand total. There was a possible 20 points on the final subtest, with a possible 10 points for one-point scores and 20 points for two-point scores. The reliability sample means by age and by sex are shown in Table 13. The corrected split-half reliability formula was computed on the subtest for one-point and two-point scores. Using one point for the correct answer, the reliability coefficient was .66. Using two points for the correct answer, the reliability coefficient was .36.

Subtest VII: Percepts and Concepts.--The purpose of this subtest is to determine the child's ability to match two ink-line drawing pictures when the basis is perceptual identity or conceptual similarity and to give a verbal explanation for the grouping. Sets of five 4" x 6" cards are placed on the table facing the child, one set at a time. He is asked to select two cards from each set that go together. He is then asked if they go together because they are "just exactly alike" or because they are "the same kind of thing." This subtest measured both a comprehension and a production process under Language Goal No. 3 in the preschool educational project supervised by the investigator.

The Percepts and Concepts subtest in the preliminary test form was three separate concept tests. All three tests were based on the concept tests developed by Deutsch and his associates (Institute for Developmental Studies, 1966) and by Ametjian (1965). Each concept subtest was designed to test a particular kind of concept.

The first test was a concept identification test wherein the child would choose from a group of five pictures (ink-line drawings) two cards that "go together" (i.e., two that were identical). The child was then asked why the cards went together and his verbal response was recorded.

The second concept subtest was a concept similarity test. Again, sets of four pictures each were presented to the child. Again the child was asked to select two cards that go together, and then to state why they go together. The basis of selection was concept similarity rather than perceptual identity (e.g., two different kinds of chairs, two different kinds of balls).

The third concept subtest, a concept specificity test, was administered in a method similar to the other two concept subtests. The concept specificity subtest was designed to measure the child's ability to classify pictured objects in terms of abstract categories (e.g., a table and a chair go together because they are furniture, a dog and a cat go together because they are animals).

Ten sets of cards were prepared for each of the first two concept subtests and eight sets were prepared for the third concept subtest. After pretesting, difficulty levels were computed for the picture-choice portion of each concept subtest. The choice of picture was to be used as the measure of comprehension. The difficulty level on concept identification was 96 per cent, 83 per cent on concept similarity, and 79 per cent on concept specificity.

An investigation of the responses as to why pictures "go together" revealed that children gave similar and yet appropriate answers to items in different tests. For example, two pictures of identical apples go together as well as a picture of a baseball and a football because "they are the same" or "there are two of them." The responses did not seem to discriminate between different kinds of concepts. A complicated coding method used at the Institute for Developmental Studies (1966) seemed cumbersome and inappropriate for scoring the responses of the preschool children in the pretest sample. Furthermore, more intense examination of the picture items used in the three preliminary concept subtests indicated a good bit of conceptual overlap between the concept similarity and concept specificity subtests (e.g., a wall telephone and a desk telephone in the concept similarity subtest). It seemed that the tests were not measuring discrete conceptual domains.

It was decided to select from the three separate preliminary concept subtests 10 item sets of pictures, five of which were to represent perceptual identity (e.g., a set containing two identical ink-line drawings) and five concept similarity items (e.g., a set containing a picture of a curly-hair dog and a picture of a straight-hair dog). The sets were randomly ordered in a single test. After selecting the pictures in each set that go together, the child was to choose whether the pictures go together because they are "just exactly alike" (perceptual identity) or because they are "the same kind of thing" (conceptual similarity). The child was to be trained by the examiner to make the appropriate choice with the use of an example representing each type of "concept" at the beginning of the subtest.

The single Concepts and Percepts subtest was quickly pre-tested with three preschool children in the Child Laboratory at San Jose State College. It was then used as part of the final form of the VLST.

The test was scored with several subscores. Each correct picture choice was scored one point, for a possible 10 points for picture choice. If the child's picture choice was correct for the item and his reason for choice was also correct, he was given an additional two points for the item. If the child made the correct picture choice but gave the incorrect reason he was given only one additional point. If the child made an incorrect picture choice the entire item was scored zero even though the child guessed the "correct" reason why the appropriate pictures in the item went together. Each item could thus be scored from zero to three points. The total number of "correct" choices were counted for "just exactly alike" (a possible total of 10 points) and "the same kind of thing" (a possible total of 10 points). The number of one-point items on "just exactly alike" and "the same kind of thing" (inappropriate reasons for correct picture choice) were also counted (a possible total of five each). A grand total was also computed for a possible total of 30 points.

The means for the various kinds of subscores on the Percepts and Concepts subtest are shown in Table 13 by sex and by age. The corrected split-half reliability was computed on the percepts portion (picture-choice) of the subtest, yielding a reliability coefficient of .82. The reliability coefficient on the concepts portion of the subtest (reasons why the pictures go together) with two points for the correct answer was .85, and .91 with one point for the correct answer. The reliability coefficient on the entire subtest, using two points for the correct answer, was .89. Using one point for the correct answer on the entire subtest, the reliability coefficient was .87.

Subtest No. IV: Speech Sound Discrimination.--The purpose of this subtest is to determine the child's ability to identify similarity and difference in acoustic value of familiar words which can be pictured. The child is presented with pairs of ink-line drawings of familiar objects whose names are words similar in pronunciation except for single sound elements (such as BOX and BLOCKS). The examiner tells the child the name of a picture in each pair. The child is to point to the picture representing the name he heard. This test was used to measure part of the comprehension process under Language Goal No. 2.

This subtest was developed using the same word pairs used in Templin's (1957) Sound Discrimination Test. An artist prepared a trial set of pictures to fit the words in the test. These pictures were tested with several three-year-old and four-year-old boys and girls to find out if the children recognized easily what each picture represented. A few pictures were changed for greater clarity before the picture pairs were arranged for the subtest preliminary testing. There was a total of 59 pairs of pictures.

The original Templin test was designed to be administered three times to each child. If a child correctly identified each picture two out of three times it was assumed the child was discriminating similar word sounds. This procedure, however, was much too time consuming. In addition, the results of pretesting with a single run-through on the test seemed to provide approximately the same number of errors on the same word pairs as the three-trial procedure.

At first it was planned to eliminate all items that were identified correctly by all children in the pretesting group. It was hoped that this would reduce the number of items in the subtest by one-third at least. The item-analysis after pretesting showed nine items that were correctly identified by all children. The remaining word pairs showed an average difficulty level of 74 per cent. Inasmuch as each word pair was designed to test a unique sound element at the beginning, middle, or end of a word, it seemed wise to keep all 59 pairs of pictures for the final subtest.

Each item was scored a plus if the child made the correct choice and a zero if the child made an incorrect choice. All plus signs were added for a possible total score of 59.

The means of the reliability sample by age and by sex are shown in Table 13. A corrected split-half formula was used to compute reliability on this subtest yielding a reliability coefficient of .83.

It had originally been planned to compute the reliability of the first seven subtests of the Vance Language Skills Test combined into one test. However, the computer could not be programmed for the number of items contained in the combination of seven subtests. Therefore, the Speech Sound Discrimination subtest (Subtest No. IV) with 59 items was considered as a single test for reliability computation, and Subtests Nos. I through III and V through VII (a total of six subtests) were combined into a single test. The Speech Sound Discrimination subtest, as previously reported, had a reliability coefficient of .83. The corrected split-half correlation coefficient on the combined six subtests, with two points for the correct answer for each item, was .91. The reliability coefficient on the same combination of subtests, with one point for the correct answer, was .94. A summary of the corrected split-half reliability coefficients on each subtest and on the total test is shown in Table 14.

Subtest No. VIII: Language Structure and Content.--The purpose of this subtest is to determine the structure and content of the child's grammatical and syntactical expression through conversation and spontaneous response to visual stimuli. The child is asked some questions by the examiner and then presented with

TABLE 14

VLST RELIABILITY SUMMARY

Subtest	Corrected Split-Half Reliability Coefficient
I. Labeling--Total	
Two points correct	.76
One point correct	.87
Verbs	
Two points correct	.72
One point correct	.78
Nouns	
Two points correct	.71
One point correct	.82
II. Spatial Relations A	.28
V. Spatial Relations B	.68
III. Environmental Sound Identification	.25
VI. Environmental Sound Labeling	
Two points correct	.36
One point correct	.66
III & VI. Environmental Sound Identification and Labeling	
Two points correct	.44
One point correct	.66
IV. Speech Sound Discrimination	.83
VII. Percepts and Concepts	
Two points correct	.89
One point correct	.87
Percepts	.82
Concepts	
Two points correct	.85
One point correct	.91
Combination--I through III and V through VII	
Two points correct	.91
One point correct	.94

two ambiguous photographs in which he is asked to tell the examiner what he sees. The interview is recorded on tape. This subtest was used to measure part of the production process under Language Goal No. 4.

The major challenge in developing this subtest was to find auditory and/or visual stimuli that would stimulate spontaneous verbal expression in the young child. The original plan for this subtest was to present to each child two simple black-and-white ink-line drawings of problem situations that would arouse the child's curiosity. The child would be asked by the examiner to TELL ME ABOUT THIS PICTURE. The child's responses would then be recorded verbatim by the examiner. Similar methods had been used in language studies reported by McCarthy (1951) as well as by Ametjian (1965) in her Relating Test. Several problems became apparent after some pretesting with the two pictures. The children usually responded with only a sentence or two at most to each picture. This did not seem to be indicative of spontaneous speech patterns. In addition, it was very difficult, with those few children who did verbalize profusely, to record in writing every word spoken by each child.

Various kinds of pictures were used with preschool children to find out what pictures stimulated the most expression--photographs and drawings in color and in black and white of familiar scenes, of ambiguous content, of stark simplicity, and of great visual complexity. A tape recorder was used to record the responses of the children.

The Language Structure and Content subtest finally developed as part of the Vance Language Skills Test was closely related to the interview technique devised by Loban (1963) for exhaustive longitudinal studies in the use and control of language in elementary school students. It was found in pretesting that young children responded with greater verbal spontaneity and length of expression when asked a few interesting questions about topics in their "here and now" or immediate past experience, such as "Tell me about the games you play" or "Tell me about your favorite television program," or "Tell me what happens when you get sick." The children then seemed to be ready to respond to questions about some interesting pictures.

A standard interview form was developed (see Subtest No. VIII, Appendix B). The examiner was to ask the child nine questions that had proved most conducive to spontaneous language expression during pretesting. The child was then shown two 8" x 10" black-and-white ambiguous photographs used in the personality studies by Murphy (1938) and her associates. The child was asked to tell what he saw in each picture. The entire interview was recorded on tape, using a Stenorette dictating machine. A typed transcription of each interview was then made.

The transcriptions were scored on four dimensions: number of words, number of untranslatable syllables, number of communication units, and number of responses. The verbalization of young preschoolers is often sprinkled with sound elements that cannot be translated into words. This is especially true for young three-year-olds. If understandable words only were counted, a spurious measure of the child's amount of verbalization would be obtained. Therefore, the number of untranslatable syllables was considered an important index of amount and structure of language. In addition, because children often string "sentences" together by the use of a simple connective such as the word "and," a count of sentences would give an unrealistic picture of the amount and kind of language expressed by a child. Therefore, "communication units" (Loban, 1963), or independent clauses, were used as a gross measure of the child's structure of language. The communication units could then be broken down into patterns of grammatical content (e.g., subject-transitive verb-direct object). A count was also made of the number of times each child made any type of verbal response to a comment or question by the examiner during the recorded interview session. This would provide one index of the length of typical verbal response simply by comparing the number of responses with the total number of words or total number of communication units used by each child during an interview. For example, one child may have said 120 words during an interview with 50 responses to examiner comments. This would present a different picture from that of a child who said 120 words in 20 responses.

All communication units were classified and coded by the investigator under the following eight patterns and one partial or incomplete unit:

	Pattern	Code	Examples
1.	Subject-Intransitive or Linking Verb	1 2 or 1②	I don't know. The rabbit eats. (or) He is crying.
2.	Subject-Transitive Verb-Direct Object	1 2 4	I like blocks. They don't got any games.
3.	Subject-Linking Verb	1②5	It's a game. That's all.
4.	Subject-Transitive Verb-Indirect Object-Direct Object	1 2 3 4	He gave me the measles.
5.	Subject-Linking Verb-Subject	(1)②1	There was Lilo. Here is my doll.
6.	Questions	Questions	What's that?
7.	Passive forms	Passive	I got stung by a buzzy bee. The boy got hit by a kid.
8.	Partials	Partials	Single-word responses of any kind. Can't tell you no more.

The guides for coding the communication units were found in Francis (1958) and Loban (1963).

The means and standard deviations of the scores in the preschool sample on the various portions of the Language Structure and Content subtest are shown in Table 15. The only significant differences between age groups or between the sexes were noted between the ages in the number of syllables and between the sexes in the number of communication units in the subject-transitive verb-indirect object-direct object (1234) pattern. These differences were at the

TABLE 15

MEANS AND STANDARD DEVIATIONS ON LANGUAGE STRUCTURE AND CONTENT SUBTEST

Pattern		Age		Sex		Total N = 50
		Age 3 N = 25	Age 4 N = 25	Boys N = 24	Girls N = 26	
Words	M	95.9	106.8	109.0	94.4	113.7
	SD	79.40	80.97	83.69	76.53	83.56
Untranslatable Syllables	M	13.7*	6.7*	13.4	11.1	12.2
	SD	20.51	5.68	18.07	13.88	15.90
Communication Units	M	27.8	26.4	30.4	24.1	27.1
	SD	15.57	11.97	15.68	11.19	13.76
1 2 or 1②	M	5.4	5.7	6.0	5.1	5.6
	SD	6.15	4.11	6.16	4.16	5.18
1 2 4	M	5.0	6.0	5.8	5.3	5.5
	SD	5.37	6.28	5.47	6.19	5.80
1②5	M	1.2	1.2	1.5	0.89	1.2
	SD	1.99	1.70	2.19	1.40	1.83
1 2 3 4	M	0.04	0.2	0.2*	0.04*	0.1
	SD	0.20	0.62	0.64	0.20	0.46
(1)②1	M	0.16	0.16	0.13	0.19	0.16
	SD	0.37	0.47	0.34	0.49	0.42
Questions	M	1.08	0.72	0.92	0.89	0.9
	SD	1.58	1.31	1.32	1.58	1.45
Passives	M	0.16	0.12	0.17	0.12	0.14
	SD	0.47	0.44	0.48	0.43	0.45
Requests	M	0.16	0.28	0.13	0.31	0.22
	SD	0.47	0.89	0.45	0.88	0.71
Partials	M	14.4	12.0	15.4	11.1	13.2
	SD	8.27	5.86	8.83	4.52	7.20
Responses	M	25.3	20.8	26.0	20.3	23.0
	SD	11.96	8.47	12.94	6.78	10.50

*$p \leq .05$

.05 level of significance. Three-year-olds would be expected to use a larger number of untranslatable syllables in their speech than the four-year-olds, as the mean scores indicate. On the other hand, because only three children scored on the 1 2 3 4 communication unit pattern, this difference must be considered spurious.

The difference between the mean scores for number of words was in the expected direction favoring the four-year-olds. Boys used more words on the average than girls. These differences, however, were not significant.

Three-year-olds had a larger average number of communication units than four-year-olds. They also had higher average scores on number of responses and number of partials. These figures suggest several possibilities. Examiners found it more difficult to understand three-year-olds than four-year-olds. Because it was permissible for the examiner to repeat the child's last understandable phrase or sentence in order to encourage language expression already under way, more such repetitions or reflections were probable on the average with three-year-olds than four-year-olds simply as a means of finding out if the examiner had heard the child correctly and had picked up the proper clue for the next response. The number of the child's responses would thus have been increased. Partials also could have been increased inasmuch as further examination of the tape recordings revealed that many of these "reflections" sounded like questions which could be answered with a partial such as a single word or two- or three-word phrases.

Partials outnumbered any other pattern of communication unit. This could be explained partially by the fact that most of the questions on the interview form could be answered with single words or phrases which seemed to complete the thought of each question (e.g., E: Tell me who you play with. S: Sonny. E: What do you play with Sonny? S: Blocks and cars. E: Do you like television? S: Yeah.). It became obvious that the interview schedule would have to be changed to provide greater stimulation for open-ended, complete-thought response from the children.

In addition to partials, the most common patterns of communication were subject-intransitive or linking verb and subject-transitive verb-direct object. The average number of responses in each of the other patterns could be attributed to a very small percentage of the children in the sample.

Average scores of the boys were higher in almost every case than those for girls. However, these differences were insignificant with the possible exception of the 1 2 3 4 pattern of communication unit.

CHAPTER IV

RESULTS: LANGUAGE SKILLS AND SOCIAL COMPETENCY MEASURES

The major hypotheses of this study were as follows:

1. The language skills scores of disadvantaged three-year-old and four-year-old children exposed to a preschool educational program for seven months will be higher than those of a comparable group who remain in the home environment during the same period of time.
2. The social competency scores of disadvantaged three-year-old and four-year-old children exposed to a preschool educational program for seven months will be higher than those of a comparable group who remain in the home environment during the same period of time.

The criterion measures, consisting of the Peabody Picture Vocabulary Test (PPVT), Form A, six subtests of the Illinois Test of Psycholinguistic Ability (ITPA), the eight subtests of the Vance Language Skills Test (VLST) developed by the investigator, and the Cain-Levine Social Competency Scale (CLSCS), were administered following the seven-month experimental treatment. The total testing sample consisted of 50 subjects.

Table 16 is a summary by age, sex, and treatment of the mean ages of the subjects as of April 1, 1967. Control Group subjects average slightly older than subjects in either of the Experimental Groups. The average age of the girl subjects over all groups is approximately four months older than the boys over all groups.

TABLE 16

MEANS AND STANDARD DEVIATIONS OF AGE OF SUBJECTS--APRIL 1, 1967 (In Months)

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	43.2	60.0	48.0	49.0	53.8	52.0	45.4	55.6	50.1
	SD	1.64	4.24	8.48	1.73	2.39	3.21	3.38	3.99	6.35
Exp. Gr. II	M	46.0	56.5	48.6	44.3	55.3	51.7	45.4	55.6	50.2
	SD	3.69	0.71	5.78	5.86	2.34	6.50	4.22	2.07	6.18
Control Gr.	M	46.8	55.8	50.8	49.0	57.8	54.9	47.6	57.6	52.8
	SD	2.59	4.65	5.81	3.61	3.49	5.51	2.97	3.89	5.88
Totals	M	45.4	57.0	49.3	47.4	55.8	52.9	46.1	56.2	51.1
	SD	3.07	3.93	6.50	4.25	3.13	5.32	3.60	3.38	6.13

Attrition, shown in Table 3, indicates that four children from the experimental groups and three children from the control group could not be tested. The four children who dropped from the experimental groups represent 11.1 per cent of the original total of 36 experimental subjects. The three children who could not be tested in the control group represent 14.2 per cent of the original total of 21 control subjects. Thus, the final sample was reduced from the original total of 57 subjects to a final total of 50 subjects. As of April 1, 1967, the average age of those children dropped from the experimental groups was 49.3 months. The average age of the children who could not be tested in the control group was 50.3 months, a difference of one month.

To test Hypotheses 1 and 2 a three-way analysis of variance was performed on each of the language skills and social competency subtests relating to each teaching goal stipulated at the beginning of the program.

Analysis of Data Relative to Hypothesis 1

Fifteen language subtests were administered to each of the 50 subjects in this study to measure the attainment of the four language goals outlined in the curriculum. The subtests were analyzed in terms of the language goals they represented.

Goal No. 1: The ability to recognize and to name objects, actions, and people.--Table 17 shows the results of the analysis of variance as well as the means, standard deviations, and number of cases on the Peabody Picture Vocabulary Test, Form A, used to measure the comprehension process in this learning area of language. Similar summaries are shown in Table 18 for the total raw scores on the Labeling subtest of the Vance Language Skills Test, used to measure the production process in this language learning area.

No significant differences were apparent on the PPVT raw scores (Table 17). In Table 18 the total raw score analysis on the VLST Labeling subtest indicates a significant difference

TABLE 17a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON PEABODY PICTURE VOCABULARY TEST

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	93.63	1	193.63	1.98
Age	391.17	1	391.17	4.00
Treatment	56.55	2	28.28	0.29
Sex x Age	10.51	1	10.51	0.11
Sex x Treatment	56.81	2	28.41	0.29
Age x Treatment	74.07	2	37.04	0.38
Sex x Age x Treatment	16.76	2	8.38	0.09
Residual	3719.04	38	97.87	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 17b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON PEABODY PICTURE VOCABULARY TEST BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	42.8	51.5	45.3	36.0	43.4	40.6	40.3	45.7	42.8
	SD	7.86	0.71	7.70	19.05	11.91	14.12	12.30	10.50	11.44
Exp. Gr. II	M	40.2	46.5	41.8	35.7	44.5	41.6	38.7	45.0	41.7
	SD	6.34	3.54	6.25	16.29	9.81	12.08	9.82	8.45	9.49
Control Gr.	M	45.4	45.5	45.4	41.0	45.8	44.2	43.8	45.7	44.8
	SD	11.37	7.33	9.21	10.39	3.43	6.34	10.49	4.95	7.70
Total	M	42.6	47.3	44.17	37.6	44.6	42.2	40.8	45.5	43.1
	SD	8.33	5.65	7.74	13.81	8.38	10.86	10.63	7.60	9.45

TABLE 18a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON LABELING SUBTEST, VLST NO. I

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	122.81	1	122.81	1.52
Age	665.50	1	665.50	8.25**
Treatment	15.79	2	7.90	0.10
Sex x Age	56.71	1	56.71	0.70
Sex x Treatment	119.82	2	59.91	0.74
Age x Treatment	19.52	2	9.76	0.12
Sex x Age x Treatment	4.08	2	2.04	0.03
Residual	3064.65	38	80.65	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 18b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON LABELING SUBTEST, VLST NO. I, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	30.6	37.0	32.4	20.7	33.0	28.4	26.9	34.1	30.3
	SD	5.03	1.41	5.19	12.86	7.58	10.99	9.39	6.52	8.74
Exp. Gr. II	M	25.8	31.5	27.3	24.7	35.2	31.7	25.4	34.3	29.6
	SD	12.70	2.12	11.08	14.05	4.71	9.53	12.27	4.40	10.2
Control Gr.	M	30.6	35.3	32.7	24.7	32.3	29.8	28.4	33.5	31.2
	SD	11.24	9.74	10.25	7.23	6.15	7.17	9.83	7.41	8.70
Total	M	28.8	34.8	30.8	23.3	33.5	30.0	26.8	33.9	30.4
	SD	10.00	6.80	9.35	10.38	5.90	9.01	10.27	6.08	9.09

($p < .01$) between the three-year-olds and the four-year-olds only, with mean scores favoring the four-year-olds.

The scores on the VLST Labeling Test were subdivided into two sections, the total number of nouns and the total number of verbs appropriately identified. Mean scores and analysis on nouns alone are summarized in Table 19, while the same type of summary on verbs alone is shown in Table 20. Again, significant differences between ages are indicated on nouns (at the .05 level of significance) as well as verbs (at the .01 level). The control group had a higher mean score on nouns than either of the experimental groups, while Experimental Group I had a higher mean score on verbs. These differences, however, are not significant.

Tables 21 and 22 show the analysis of the VLST Labeling raw scores in terms of the total number of points on two-point answers (Table 21) and the total number of points on one-point answers (Table 22). Two-point answers indicated comprehension of the specific concepts, while one-point answers indicated comprehension of the concepts in more general terms. A significant difference between ages was noted for two-point mean scores (Table 21) at the .01 level of significance. No significant differences were reported in the analysis of one-point scores. Again, mean scores favored the control group on both the two-point and the one-point analyses but not significantly.

An investigation of Tables 17, 18, 19, 20, 21, and 22 reveals that Hypothesis 1 in relation to Language Goal No. 1 was not confirmed.

TABLE 19a

THREE-WAY ANALYSIS OF VARIANCE OF NOUN SCORES, LABELING SUBTEST, VLST NO. I

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	58.37	1	58.37	1.68
Age	194.36	1	194.36	5.58*
Treatment	16.88	2	8.44	0.24
Sex x Age	60.33	1	60.33	1.73
Sex x Treatment	47.37	2	23.69	0.68
Age x Treatment	11.71	2	5.86	0.17
Sex x Age x Treatment	7.89	2	3.95	0.11
Residual	1323.92	38	34.84	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$

**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 19b

MEANS AND STANDARD DEVIATIONS OF NOUN SCORES, LABELING SUBTEST, VLST NO. I, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	21.6	24.0	22.3	14.7	23.2	20.0	19.0	23.4	21.1
	SD	3.05	1.41	2.81	9.24	4.27	7.37	6.53	3.55	5.65
Exp. Gr. II	M	19.5	21.0	19.9	17.3	24.5	22.1	18.8	23.6	21.1
	SD	8.43	4.24	7.34	9.61	3.21	6.51	8.29	3.54	6.79
Control Gr.	M	23.0	24.8	23.8	18.0	22.2	20.8	21.1	23.2	22.3
	SD	6.44	6.55	6.14	4.58	4.36	4.63	6.03	5.16	5.50
Total	M	21.3	23.6	22.0	16.7	23.3	21.0	19.6	23.4	21.5
	SD	6.29	4.90	5.86	7.21	3.84	6.03	6.86	4.10	5.92

TABLE 20a

THREE-WAY ANALYSIS OF VARIANCE OF VERB SCORES, LABELING SUBTEST, VLST NO. I

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	11.85	1	11.85	0.93
Age	140.57	1	140.57	11.03**
Treatment	4.83	2	2.42	0.19
Sex x Age	.06	1	.06	0.00
Sex x Treatment	23.47	2	11.74	0.92
Age x Treatment	1.04	2	.52	0.04
Sex x Age x Treatment	.99	2	.50	0.04
Residual	484.33	38	12.75	

$^{*}F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
$^{**}F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 20b

MEANS AND STANDARD DEVIATIONS OF VERB SCORES, LABELING SUBTEST, VLST NO. I, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	9.0	13.0	10.1	6.0	9.8	8.4	7.9	10.7	9.2
	SD	2.92	2.83	3.29	4.00	3.56	3.96	3.44	3.50	3.65
Exp. Gr. II	M	6.3	10.5	7.4	7.3	10.7	9.6	6.7	10.6	8.5
	SD	4.72	2.12	4.50	4.51	2.07	3.25	4.39	1.92	3.92
Control Gr.	M	7.6	10.5	8.9	6.7	10.2	9.0	7.3	10.3	8.9
	SD	5.03	3.42	4.40	3.06	2.32	2.96	4.17	2.63	3.64
Total	M	7.6	11.1	8.8	6.7	10.2	9.0	7.2	10.5	8.9
	SD	4.21	2.85	4.12	3.43	2.51	3.29	3.90	2.60	3.67

TABLE 21a

THREE-WAY ANALYSIS OF VARIANCE OF TWO-POINT SCORES, LABELING SUBTEST, VLST NO. I

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	90.72	1	90.72	1.41
Age	483.20	1	483.20	7.52**
Treatment	20.30	2	10.15	0.16
Sex x Age	61.04	1	61.04	0.95
Sex x Treatment	94.61	2	47.31	0.74
Age x Treatment	53.97	2	26.99	0.42
Sex x Age x Treatment	3.38	2	1.69	0.03
Residual	2441.00	38	64.24	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 21b

MEANS AND STANDARD DEVIATIONS OF TWO-POINT SCORES, LABELING SUBTEST, VLST NO. I, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	24.0	32.0	26.3	16.0	27.6	23.3	21.0	28.9	24.7
	SD	3.74	0.00	4.96	8.72	7.27	9.38	6.85	6.31	7.55
Exp. Gr. II	M	21.3	24.0	22.0	19.3	28.3	25.3	20.7	27.3	23.8
	SD	10.86	2.83	9.32	13.01	5.43	9.00	10.82	5.12	9.02
Control Gr.	M	25.2	27.5	26.2	19.3	26.0	23.8	23.0	26.6	25.0
	SD	9.96	9.57	9.24	6.11	6.20	6.67	8.75	7.25	7.92
Total	M	23.4	27.8	24.8	18.2	27.3	24.2	21.5	27.4	24.5
	SD	8.5	7.05	8.17	8.57	5.96	8.10	8.72	6.18	8.06

TABLE 22a

THREE-WAY ANALYSIS OF VARIANCE OF ONE-POINT SCORES, LABELING SUBTEST, VLST NO. I

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	2.42	1	2.42	0.50
Age	14.55	1	14.55	3.00
Treatment	4.85	2	2.43	0.50
Sex x Age	.08	1	.08	0.02
Sex x Treatment	1.64	2	.82	0.17
Age x Treatment	13.37	2	6.69	1.38
Sex x Age x Treatment	8.01	2	4.01	0.83
Residual	184.52	38	4.86	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 22b

MEANS AND STANDARD DEVIATIONS OF ONE-POINT SCORES, LABELING SUBTEST, VLST NO. I, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	6.6	5.0	6.1	4.7	5.4	5.1	5.9	5.3	5.6
	SD	1.52	1.41	1.57	4.16	1.52	2.53	2.70	1.38	2.13
Exp. Gr. II	M	4.5	7.5	5.3	5.3	6.8	6.3	4.8	7.0	5.8
	SD	2.43	0.71	2.49	1.16	2.79	2.40	2.05	2.39	2.43
Control Gr.	M	5.4	7.8	6.4	5.3	6.3	6.0	5.4	6.9	6.2
	SD	2.30	2.22	2.46	2.08	1.63	1.73	2.07	1.91	2.07
Total	M	5.4	7.0	6.0	5.1	6.2	5.8	5.3	6.5	5.9
	SD	2.19	2.00	2.22	2.42	2.05	2.20	2.23	2.02	2.19

Goal No. 2: The ability to recognize and label various sounds in the environment.--Three subtests were used to measure the attainment of this language goal. The Speech Sound Discrimination and the Environmental Sound Identification subtests of the Vance Language Skills Test were used to measure the comprehension process. The Environmental Sound Labeling subtest of the VLST was used to measure the production process.

Table 23 shows the analysis summary of the Speech Sound Discrimination subtest. The treatment main effect was significant at the .05 level on this particular subtest. An investigation of the mean scores on this subtest shows higher mean scores for the control group than for either of the experimental groups.

A t-test was computed between Experimental Groups I and II, between Experimental Group I and the control group, and between Experimental Group II and the control group. These computations are summarized in Table 24. Apparently the significant treatment difference found in the analysis of variance on the Speech Sound Discrimination subtest was caused by the lower mean in Experimental Group II.

Scores on the Environmental Sound Identification subtest of the VLST are summarized in Table 25. No significant differences were found on this subtest.

The total raw score analysis of the Environmental Sound Labeling subtest of the VLST is shown in Table 26. There was a significant age difference on these scores, this difference favoring the four-year-olds.

TABLE 23a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON SPEECH SOUND DISCRIMINATION SUBTEST, VLST NO. IV

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	31.46	1	31.46	0.99
Age	56.30	1	56.30	1.77
Treatment	255.88	2	127.94	4.02*
Sex x Age	5.95	1	5.95	0.19
Sex x Treatment	4.32	2	2.16	0.07
Age x Treatment	86.49	2	43.25	1.36
Sex x Age x Treatment	96.18	2	48.09	1.51
Residual	1208.01	38	31.79	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 23b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON SPEECH SOUND DISCRIMINATION SUBTEST, VLST NO. IV, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	50.2	52.5	50.9	51.3	49.6	50.3	50.6	50.4	50.5
	SD	1.64	3.54	2.27	3.79	5.64	4.80	2.45	5.03	3.72
Exp. Gr. II	M	46.2	47.5	46.5	39.3	50.7	46.9	43.9	49.9	46.7
	SD	6.05	2.12	5.21	12.90	5.01	9.45	8.72	4.55	7.52
Control Gr.	M	52.0	53.0	52.4	50.3	49.8	50.0	51.4	51.1	51.2
	SD	6.00	4.24	5.00	2.31	5.91	4.82	4.78	5.30	4.93
Total	M	49.3	51.5	50.0	47.0	50.1	49.0	48.4	50.5	49.5
	SD	5.40	4.04	5.01	8.93	5.19	6.71	6.78	4.81	5.92

TABLE 24

t-TESTS ON SPEECH SOUND DISCRIMINATION SUBTEST

Groups	df	t
Experimental Groups I and II	30	2.46*
Experimental Group I and Control Group	31	0.465
Experimental Group II and Control Group	33	2.23*

*$p \leq .05$

The Environmental Sound Labeling subtest was subdivided into the total number of points for two-point answers and the total number of points for one-point answers. Two-point answers indicated an ability to label sounds with finer discrimination than one-point answers. The summaries of these two subdivisions of the Environmental Sound Labeling subtest are shown in Tables 27 and 28. A significant difference was found between ages on two-point scores (Table 27). However, no significant differences were found on one-point scores (Table 28).

An analysis of all subtests measuring Language Goal No. 2 reveals no confirmation of Hypothesis 1. On the contrary, a significant treatment difference in favor of the control group was found in the Speech Sound Discrimination subtest of the VLST (Table 23).

TABLE 25a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON ENVIRONMENTAL SOUND IDENTIFICATION SUBTEST, VLST NO. III

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.60	1	.60	0.15
Age	1.99	1	1.99	0.49
Treatment	7.73	2	3.87	0.94
Sex x Age	.65	1	.65	0.16
Sex x Treatment	3.56	2	1.78	0.43
Age x Treatment	9.63	2	4.82	1.17
Sex x Age x Treatment	.26	2	.13	0.03
Residual	156.02	38	4.11	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 25b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON ENVIRONMENTAL SOUND IDENTIFICATION SUBTEST, VLST NO. III, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	7.0	6.0	6.7	7.3	7.2	7.3	7.1	6.9	7.0
	SD	1.58	1.41	1.50	2.08	3.03	2.55	1.64	2.61	2.07
Exp. Gr. II	M	7.5	9.0	7.9	6.7	8.7	8.0	7.2	8.8	7.9
	SD	2.07	0.00	1.89	3.22	1.37	2.18	2.33	1.17	1.98
Control Gr.	M	7.2	7.3	7.2	7.7	7.8	7.8	7.4	7.6	7.5
	SD	2.17	1.71	1.86	1.53	1.72	1.56	1.85	1.65	1.69
Total	M	7.3	7.4	7.3	7.2	7.9	7.7	7.2	7.8	7.5
	SD	1.84	1.69	1.76	2.11	2.05	2.06	1.90	1.92	1.91

TABLE 26a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	122.81	1	122.81	1.52
Age	665.50	1	665.50	8.25**
Treatment	15.79	2	7.90	0.10
Sex x Age	56.71	1	56.71	0.70
Sex x Treatment	119.82	2	59.91	0.74
Age x Treatment	19.52	2	9.76	0.12
Sex x Age x Treatment	4.08	2	2.04	0.03
Residual	3064.65	38	80.65	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 26b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	8.6	10.5	9.1	6.3	7.2	6.9	7.8	8.1	7.9
	SD	2.97	0.71	2.61	5.69	2.68	3.68	3.96	2.73	3.33
Exp. Gr. II	M	7.0	10.5	7.9	5.7	12.0	9.9	6.6	11.6	8.9
	SD	4.98	3.54	4.70	4.04	1.90	4.05	4.48	2.20	4.35
Control Gr.	M	6.8	8.8	7.7	7.0	6.5	6.7	6.9	7.4	7.2
	SD	3.49	6.50	4.80	7.00	3.27	4.36	4.58	4.62	4.48
Total	M	7.4	9.6	8.2	6.3	8.6	7.8	7.0	9.0	8.0
	SD	3.81	4.57	4.11	4.98	3.59	4.17	4.20	3.86	4.11

TABLE 27a

THREE-WAY ANALYSIS OF VARIANCE OF TWO-POINT SCORES, ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	1.30	1	1.30	0.91
Age	7.72	1	7.72	5.41*
Treatment	.50	2	.25	0.18
Sex x Age	.69	1	.69	0.48
Sex x Treatment	.31	2	.16	0.11
Age x Treatment	1.47	2	.74	0.51
Sex x Age x Treatment	.45	2	.23	0.16
Residual	54.18	38	1.43	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 27b

MEANS AND STANDARD DEVIATIONS OF TWO-POINT SCORES, ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	6.8	8.0	7.1	5.3	4.4	4.8	6.3	5.4	5.9
	SD	2.68	0.00	2.27	5.03	2.19	3.20	3.45	2.51	2.97
Exp. Gr. II	M	5.3	8.0	6.0	4.7	10.0	8.2	5.1	9.5	7.2
	SD	3.72	2.83	3.55	3.06	2.19	3.53	3.33	2.33	3.61
Control Gr.	M	4.8	6.5	5.6	5.3	4.3	4.7	5.0	5.2	5.1
	SD	3.03	5.00	3.84	5.03	1.97	3.00	3.55	3.43	3.38
Total	M	5.6	7.3	6.2	5.1	6.4	5.9	5.4	6.6	6.0
	SD	3.12	3.55	3.28	3.89	3.41	3.55	3.34	3.40	3.39

TABLE 28a

THREE-WAY ANALYSIS OF VARIANCE OF ONE-POINT SCORES, ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	8.59	1	8.59	0.82
Age	24.00	1	24.00	2.28
Treatment	23.46	2	11.73	1.11
Sex x Age	1.40	1	1.40	0.13
Sex x Treatment	17.08	2	8.54	0.81
Age x Treatment	33.01	2	16.51	1.57
Sex x Age x Treatment	15.53	2	7.77	0.74
Residual	400.47	38	10.54	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 28b

MEANS AND STANDARD DEVIATIONS OF ONE-POINT SCORES, ENVIRONMENTAL SOUND LABELING SUBTEST, VLST NO. VI, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	1.8	2.5	2.0	1.0	2.8	2.1	1.5	2.7	2.1
	SD	0.45	0.71	0.58	1.0	1.10	1.36	0.76	0.95	1.03
Exp. Gr. II	M	1.7	2.5	1.9	1.0	2.0	1.7	1.4	2.1	1.8
	SD	1.37	0.71	1.25	1.00	0.63	0.87	1.24	0.64	1.03
Control Gr.	M	2.0	2.3	2.1	1.7	2.2	2.0	1.9	2.2	2.1
	SD	1.00	1.71	1.27	2.08	1.47	1.58	1.36	1.48	1.39
Total	M	1.8	2.4	2.0	1.2	2.3	1.9	1.6	2.3	1.96
	SD	0.98	1.19	1.06	1.30	1.11	1.26	1.12	1.11	1.16

Goal No. 3: The ability to relate and to classify words and ideas.--Seven language subtests were used to measure achievement of the language goal. The comprehension process was measured by the Visual Decoding and the Visual Motor Association subtests of the ITPA and by the Spatial Relations A subtest and the picture-choice (percept) portion of the Percepts and Concepts subtest of the VLST. Production was measured by the Auditory-Vocal Association and the Auditory-Vocal Automatic subtests of the ITPA and by the Spatial Relations B subtest and the concept portion of the Percepts and Concepts subtest of the VLST.

An investigation of the ITPA Visual Decoding subtest analysis summary in Table 29 and the ITPA Visual-Motor Association analysis summary in Table 30 indicates significant main effect differences for age only. This significance is at the .05 level in the Visual Decoding subtest and the .01 level in the Visual-Motor Association subtest. The mean scores favor the four-year-olds. In the treatment main effect, the mean scores favored the control group, although not significantly.

Table 31 summarizes the analysis of the Spatial Relations A subtest of the VLST. No significant differences were noted on this subtest. The mean scores slightly favored the control group, but not significantly.

The picture-choice (percept) portion of the VLST Percepts and Concepts subtest reveals significant age as well as treatment main effect differences in Table 32. The age difference was

TABLE 29a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES
ON VISUAL DECODING SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	10.15	1	10.15	1.17
Age	41.80	1	41.80	4.83*
Treatment	30.94	2	15.47	1.79
Sex x Age	7.76	1	7.76	0.90
Sex x Treatment	13.70	2	6.85	0.79
Age x Treatment	16.47	2	8.24	0.95
Sex x Age x Treatment	17.89	2	8.95	1.03
Residual	328.87	38	8.65	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 29b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES
ON VISUAL DECODING SUBTEST, ITPA,
BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	11.4	15.5	12.6	9.67	12.8	11.6	10.8	13.6	12.1
	SD	2.78	2.12	3.78	3.51	1.48	2.72	3.54	1.99	3.17
Exp. Gr. II	M	10.3	11.5	10.6	8.7	10.8	10.1	9.8	11.0	10.4
	SD	2.34	4.95	2.77	1.15	3.31	2.89	2.11	3.38	2.76
Control Gr.	M	11.4	9.5	10.6	9.3	12.5	11.4	10.6	11.3	11.0
	SD	4.34	2.65	3.61	2.89	1.52	2.46	3.78	2.45	3.03
Total	M	11.0	11.5	11.2	9.2	12.0	11.0	10.4	11.8	11.1
	SD	3.31	3.74	3.38	2.39	2.35	2.68	3.08	2.79	3.01

TABLE 30a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON VISUAL-MOTOR ASSOCIATION SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	5.69	1	5.69	0.44
Age	107.38	1	107.38	8.30**
Treatment	.28	2	.14	0.01
Sex x Age	9.03	1	9.03	0.70
Sex x Treatment	.71	2	.36	0.03
Age x Treatment	9.69	2	4.85	0.37
Sex x Age x Treatment	6.35	2	3.18	0.24
Residual	491.90	38	12.94	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 30b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON VISUAL-MOTOR ASSOCIATION SUBTEST, ITPA, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	11.0	13.0	11.6	8.7	13.4	11.6	10.1	13.3	11.6
	SD	2.24	4.24	2.70	6.81	1.52	4.53	4.19	2.14	3.66
Exp. Gr. II	M	9.7	14.0	10.8	9.0	13.0	11.7	9.4	13.3	11.2
	SD	4.68	1.41	4.46	7.94	3.03	5.05	5.43	2.66	4.66
Control Gr.	M	11.6	12.0	11.8	9.7	13.2	12.0	10.9	12.7	11.9
	SD	1.67	1.16	1.39	4.04	2.04	3.12	2.70	1.77	2.35
Total	M	10.7	12.8	11.4	9.1	13.2	11.8	10.1	13.0	11.6
	SD	3.18	2.05	2.98	5.62	2.19	4.13	4.18	2.11	3.59

TABLE 31a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON SPATIAL RELATIONS A SUBTEST, VLST NO. II

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.09	1	.09	0.08
Age	.93	1	.93	0.80
Treatment	.82	2	.41	0.35
Sex x Age	.32	1	.32	0.27
Sex x Treatment	4.06	2	2.03	1.75
Age x Treatment	.05	2	.93	0.02
Sex x Age x Treatment	.00	2	.00	0.00
Residual	44.17	38	1.16	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 31b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON SPATIAL RELATIONS A SUBTEST, VLST NO. II, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	3.0	3.5	3.1	3.0	3.2	3.1	3.0	3.3	3.1
	SD	0.71	2.12	1.07	0.00	1.30	0.99	0.54	1.38	0.99
Exp. Gr. II	M	2.5	3.0	2.6	3.3	3.5	3.4	2.8	3.4	3.1
	SD	0.55	0.00	0.52	1.16	1.64	1.42	0.83	1.41	1.14
Control Gr.	M	3.6	4.0	3.8	3.0	3.0	3.0	3.4	3.4	3.4
	SD	0.89	0.82	0.83	1.00	1.10	1.0	0.92	1.08	0.98
Total	M	3.0	3.6	3.2	3.1	3.2	3.2	3.0	3.4	3.2
	SD	0.82	1.06	0.93	0.78	1.30	1.13	0.79	1.22	1.03

TABLE 32a

THREE-WAY ANALYSIS OF VARIANCE ON RAW SCORES ON PICTURE-CHOICE (PERCEPTS) PORTION OF PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	12.23	1	12.23	1.70
Age	75.78	1	75.78	10.53**
Treatment	47.06	2	23.53	3.27*
Sex x Age	1.44	1	1.44	0.20
Sex x Treatment	32.77	2	16.39	2.28
Age x Treatment	1.33	2	.67	0.09
Sex x Age x Treatment	.12	2	.06	0.00
Residual	273.60	38	7.20	

$^{*}F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$

$^{**}F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 32b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON PICTURE-CHOICE (PERCEPTS) PORTION OF PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	7.4	10.0	8.1	5.3	8.4	7.3	6.6	8.9	7.7
	SD	1.52	0.00	1.77	5.03	1.67	3.37	3.11	1.57	2.69
Exp. Gr. II	M	3.8	5.5	4.3	4.7	7.3	6.4	4.1	6.9	5.4
	SD	2.64	3.54	2.71	4.17	2.25	3.05	2.98	2.48	3.02
Control Gr.	M	7.4	10.0	8.6	4.3	7.7	6.6	6.3	8.6	7.6
	SD	2.51	0.00	2.24	3.51	3.01	3.40	3.11	2.55	2.98
Total	M	6.1	8.9	7.0	4.8	7.8	6.7	5.6	8.1	6.86
	SD	2.79	2.48	2.96	3.73	2.31	3.16	3.15	2.37	3.04

significant at the .01 level, while the treatment difference was significant at the .05 level. The mean scores favored the control group and the four-year-olds. A series of t-tests were computed between Experimental Groups I and II, Experimental Group I and the control group, and Experimental Group II and the control group. This analysis is shown in Table 33. The significant difference in treatment found in the analysis of variance seemed to be due to the lower performance of Experimental Group II.

TABLE 33

t-TESTS ON PERCEPTS AND CONCEPTS SUBTEST--
PICTURE CHOICE

Groups	df	t
Experimental Groups I and II	30	2.00*
Experimental Group I and Control Group	31	1.01
Experimental Group II and Control Group	33	2.16*

*$p \leq .05$

The analysis of the Auditory-Vocal Automatic subtest of the ITPA, shown in Table 34, indicated no significant differences, although the mean scores favored the control group. The Auditory-Vocal Association subtest of the ITPA, on the other hand, revealed a significant age main effect difference at the .01 level. This is shown in Table 35. Again the mean scores slightly favored the control group.

TABLE 34a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON AUDITORY-VOCAL AUTOMATIC SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	19.26	1	19.26	1.83
Age	38.12	1	38.12	3.63
Treatment	25.80	2	12.90	1.23
Sex x Age	12.35	1	12.35	1.18
Sex x Treatment	18.70	2	9.35	.89
Age x Treatment	12.61	2	6.31	.60
Sex x Age x Treatment	9.60	2	4.80	0.46
Residual	399.50	38	10.51	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 34b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON AUDITORY-VOCAL AUTOMATIC SUBTEST, ITPA, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	7.0	10.0	7.9	3.3	7.2	5.8	5.6	8.0	6.7
	SD	2.00	5.66	3.19	2.89	3.56	3.69	2.88	3.96	3.52
Exp. Gr. II	M	6.2	5.0	5.9	3.7	7.3	6.1	5.3	6.8	6.0
	SD	1.72	0.00	1.55	3.51	2.73	3.33	2.55	2.55	2.57
Control Gr.	M	7.4	8.0	7.7	6.3	7.7	7.2	7.0	7.8	7.4
	SD	4.93	3.46	4.09	1.16	3.78	3.11	3.82	3.46	3.54
Total	M	6.8	7.8	7.1	4.4	7.4	6.4	6.0	7.5	6.7
	SD	2.97	3.66	3.17	2.74	3.16	3.30	3.06	3.26	3.23

TABLE 35a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON AUDITORY-VOCAL ASSOCIATION SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.00	1	.00	.00
Age	147.78	1	147.78	10.57**
Treatment	30.16	2	15.08	1.08
Sex x Age	1.29	1	1.29	0.09
Sex x Treatment	8.69	2	4.35	0.31
Age x Treatment	7.46	2	3.73	0.27
Sex x Age x Treatment	7.04	2	3.52	0.25
Residual	531.15	38	13.98	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 35b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON AUDITORY-VOCAL ASSOCIATION SUBTEST, ITPA, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	8.4	13.5	9.9	7.33	12.0	10.3	8.0	12.4	10.1
	SD	2.3	4.95	3.72	5.03	5.15	5.31	3.25	4.72	4.48
Exp. Gr. II	M	7.7	9.0	8.0	7.0	11.3	9.9	7.4	10.8	9.0
	SD	2.07	1.41	1.93	6.56	3.39	4.76	3.68	3.11	3.73
Control Gr.	M	8.6	12.3	10.2	9.3	12.5	11.4	8.9	12.4	10.8
	SD	3.78	3.78	4.02	2.08	3.27	3.21	3.09	3.27	3.59
Total	M	8.2	11.8	9.4	7.9	11.9	10.5	8.1	11.9	9.98
	SD	2.61	3.62	3.37	4.40	3.72	4.35	3.28	3.61	3.91

No significant differences were found on the Spatial Relations B subtest of the VLST, as shown in Table 36. The mean scores, however, slightly favored the control group.

The concept portion of the Percepts and Concepts subtest of the VLST was subdivided into four sections: the total points on two-point answers to "just exactly alike" (Table 37); the total points on one-point answers to "just exactly alike" (Table 38); the total points on two-point answers to "the same kind of thing" (Table 39); and the total points on one-point answers to "the same kind of thing" (Table 40). A significant age difference at the .01 level was found in both the two-point and the one-point scores on "just exactly alike," shown in Tables 37 and 38. All mean scores favored the control group with the exception of the one-point scores on "the same kind of thing" (Table 40), which favored Experimental Group I. These differences were not significant.

Hypothesis 1 with respect to Language Goal No. 3 was not confirmed.

The percept or picture-choice (comprehension) and concept (production) portions of the VLST Percepts and Concepts subtest were combined into a total raw score analysis on this subtest. This analysis is summarized in Table 41. A significant age main effect difference was found at the .01 level, with mean scores favoring the four-year-olds. The treatment main effect mean scores, although not significant, favored the control group.

TABLE 36a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON SPATIAL RELATIONS B SUBTEST, VLST NO. V

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.62	1	.62	0.13
Age	8.65	1	8.65	1.77
Treatment	3.81	2	1.91	0.39
Sex x Age	.12	1	.12	0.03
Sex x Treatment	4.87	2	2.44	0.50
Age x Treatment	3.83	2	1.92	0.39
Sex x Age x Treatment	9.10	2	4.55	0.93
Residual	186.22	38	4.90	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 36b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON SPATIAL RELATIONS B SUBTEST, VLST NO. V, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	5.8	7.5	6.3	6.0	5.2	5.5	5.9	5.9	5.9
	SD	1.92	3.54	2.29	2.65	2.28	2.27	2.03	2.61	2.23
Exp. Gr. II	M	5.3	6.0	5.5	4.0	6.8	5.9	4.9	6.6	5.7
	SD	1.75	2.83	1.85	3.00	1.47	2.37	2.15	1.69	2.09
Control Gr.	M	5.6	6.3	5.9	6.3	6.7	6.6	5.9	6.5	6.2
	SD	2.07	1.89	1.90	2.52	2.50	2.35	2.10	2.17	2.10
Total	M	5.6	6.5	5.9	5.4	6.3	6.0	5.5	6.4	5.9
	SD	1.79	2.20	1.94	2.60	2.11	2.28	2.06	2.10	2.11

TABLE 37a

THREE-WAY ANALYSIS OF VARIANCE OF TWO-POINT "JUST EXACTLY ALIKE" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	15.47	1	15.47	1.60
Age	54.13	1	54.13	5.60*
Treatment	12.43	2	6.22	0.64
Sex x Age	.43	1	.43	0.04
Sex x Treatment	19.39	2	9.70	1.00
Age x Treatment	5.30	2	2.65	0.27
Sex x Age x Treatment	18.25	2	9.13	0.94
Residual	367.20	38	9.66	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$

**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 37b

MEANS AND STANDARD DEVIATIONS OF TWO-POINT "JUST EXACTLY ALIKE" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	1.6	6.0	2.9	2.0	2.8	2.5	1.8	3.7	2.7
	SD	2.61	0.00	3.02	2.00	3.90	3.16	2.25	3.55	2.99
Exp. Gr. II	M	1.7	3.0	2.0	0.7	5.0	3.6	1.3	4.5	2.8
	SD	3.20	1.41	2.83	1.12	3.29	3.43	2.65	2.98	3.17
Control Gr.	M	4.4	6.0	5.1	2.0	3.0	2.7	3.5	4.2	3.9
	SD	3.85	2.83	3.33	3.46	3.29	3.16	3.67	3.33	3.39
Total	M	2.5	5.3	3.4	1.6	3.6	2.9	2.2	4.2	3.2
	SD	3.31	2.36	3.26	2.19	3.41	3.16	2.94	3.16	3.18

TABLE 38a

THREE-WAY ANALYSIS OF VARIANCE OF ONE-POINT "JUST EXACTLY ALIKE" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.12	1	.12	0.08
Age	8.60	1	8.60	5.81*
Treatment	.27	2	.14	0.09
Sex x Age	.02	1	.02	0.01
Sex x Treatment	1.01	2	.51	0.34
Age x Treatment	4.47	2	2.24	1.51
Sex x Age x Treatment	.23	2	.12	0.08
Residual	56.20	38	1.48	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 38b

MEANS AND STANDARD DEVIATIONS OF ONE-POINT "JUST EXACTLY ALIKE" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.8	1.0	0.9	0.7	0.4	0.5	0.8	0.6	0.67
	SD	0.84	1.41	0.90	1.16	0.55	0.76	0.89	0.79	0.82
Exp. Gr. II	M	0.0	1.5	0.4	0.3	1.8	1.3	0.1	1.8	0.88
	SD	0.00	0.71	0.74	0.58	1.94	1.73	0.33	1.67	1.41
Control Gr.	M	0.4	1.5	0.9	0.0	1.3	0.9	0.3	1.4	0.89
	SD	0.55	1.73	1.27	0.00	1.86	1.62	0.46	1.71	1.41
Total	M	0.4	1.4	0.71	0.3	1.2	0.92	0.36	1.28	0.8
	SD	0.62	1.30	1.00	0.71	1.64	1.44	0.64	1.51	1.24

TABLE 39a

THREE-WAY ANALYSIS OF VARIANCE OF TWO-POINT "SAME KIND OF THING" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.07	1	.07	0.01
Age	39.71	1	39.71	4.03
Treatment	58.41	2	29.21	2.96
Sex x Age	14.63	1	14.63	1.48
Sex x Treatment	47.62	2	23.81	2.42
Age x Treatment	33.02	2	16.51	1.68
Sex x Age x Treatment	.59	2	.30	0.03
Residual	374.40	38	9.85	

$^{*}F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
$^{**}F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 39b

MEANS AND STANDARD DEVIATIONS OF TWO-POINT "SAME KIND OF THING" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	2.4	8.0	4.0	2.7	5.6	4.5	2.5	6.3	4.3
	SD	1.67	2.83	3.27	3.06	3.29	3.34	2.07	3.15	3.20
Exp. Gr. II	M	0.33	1.0	0.5	4.0	3.0	3.3	1.6	2.5	2.0
	SD	0.82	1.41	0.93	3.46	3.74	3.46	2.60	3.34	2.92
Control Gr.	M	4.0	7.0	5.3	3.3	3.7	3.6	3.8	5.0	4.4
	SD	3.74	3.46	3.74	3.06	4.08	3.58	3.28	4.03	3.67
Total	M	2.1	5.8	3.3	3.3	4.0	3.8	2.6	4.6	3.56
	SD	2.68	3.92	3.52	2.83	3.67	3.36	2.74	3.77	3.41

TABLE 40a

THREE-WAY ANALYSIS OF VARIANCE OF ONE-POINT "SAME KIND OF THING" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	2.25	1	2.25	1.08
Age	1.09	1	1.09	0.52
Treatment	3.66	2	1.83	0.87
Sex x Age	2.90	1	2.90	1.38
Sex x Treatment	.21	2	.11	0.05
Age x Treatment	.61	2	.30	0.15
Sex x Age x Treatment	2.93	2	1.47	0.53
Residual	79.72	38	2.10	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 40b

MEANS AND STANDARD DEVIATIONS OF ONE-POINT "SAME KIND OF THING" SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	1.2	2.0	1.4	2.0	2.4	2.3	1.5	2.3	1.9
	SD	1.30	0.00	1.13	1.73	2.07	1.83	1.41	1.70	1.55
Exp. Gr. II	M	0.3	1.5	0.6	2.0	0.8	1.2	0.9	1.0	0.9
	SD	0.52	0.71	0.74	2.65	0.75	1.56	1.62	0.76	1.25
Control Gr.	M	1.2	1.75	1.4	1.67	1.83	1.8	1.4	1.8	1.61
	SD	1.79	1.50	1.59	0.58	1.47	1.20	1.41	1.40	1.38
Total	M	0.9	1.8	1.17	1.9	1.6	1.73	1.24	1.68	1.46
	SD	1.26	1.04	1.24	1.62	1.54	1.54	1.45	1.38	1.42

TABLE 41a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	42.63	1	42.63	0.72
Age	693.99	1	693.99	11.67**
Treatment	344.69	2	172.35	2.90
Sex x Age	26.10	1	26.10	0.44
Sex x Treatment	328.57	2	164.29	2.76
Age x Treatment	27.19	2	13.60	0.23
Sex x Age x Treatment	18.72	2	9.36	0.16
Residual	2259.18	38	59.45	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 41b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON PERCEPTS AND CONCEPTS SUBTEST, VLST NO. VII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	13.4	27.0	17.3	12.7	19.6	17.0	13.1	21.7	17.1
	SD	2.70	1.41	7.02	12.50	8.44	9.91	7.00	7.80	8.38
Exp. Gr. II	M	6.2	12.5	7.8	11.7	18.0	15.9	8.0	16.6	12.1
	SD	5.81	7.78	6.43	10.21	8.27	8.88	7.40	8.00	8.66
Control Gr.	M	17.4	26.3	21.3	11.3	17.5	15.4	15.1	21.0	18.4
	SD	7.60	1.26	7.16	10.07	9.07	9.29	8.48	8.17	8.60
Total	M	11.9	23.0	15.6	11.9	18.3	16.1	11.9	19.8	15.9
	SD	7.25	7.19	8.86	9.53	8.11	8.99	7.95	8.00	8.84

Goal No. 4: The ability to express ideas in gesture and in word.--Three language subtests were used to test the achievement of this production-centered language goal: the Vocal Encoding and Motor Encoding subtests of the ITPA and the Language Structure and Content subtest of the VLST.

Table 42 contains the summary of the analysis on the ITPA Vocal Encoding subtest. No significant differences were found on this subtest, but the mean scores favored the control group.

The analysis summary of the ITPA Motor Encoding subtest is contained in Table 43. A significant age and treatment interaction was noted at the .05 level, with boys scoring higher than girls. The control group scored higher than either of the experimental groups, but the difference was not significant.

The VLST Language Structure and Content subtest is, in reality, a combination of several subtests. The first portion, Language Structure, deals with the number of words, communication units, responses, and untranslatable syllables spoken by each child during a tape-recorded interview. Tables 44, 45, 46, and 47 show the analyses of these sub-subtests in their respective order.

In Table 44 it is evident no significant differences were found in the total number of words spoken by the individual children.

Table 45 summarizes the analysis of the total number of communication units, or independent clauses. No significant differences were found.

TABLE 42a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON VOCAL ENCODING SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	23.03	1	23.03	1.08
Age	83.42	1	83.42	3.90
Treatment	9.95	2	4.98	0.23
Sex x Age	18.24	1	18.24	0.85
Sex x Treatment	11.42	2	5.71	0.27
Age x Treatment	13.50	2	6.75	0.32
Sex x Age x Treatment	1.49	2	.75	0.03
Residual	812.75	38	21.39	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 42b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON VOCAL ENCODING SUBTEST, ITPA, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	10.8	12.0	11.1	7.3	10.6	9.4	9.5	11.0	10.2
	SD	5.22	5.66	4.88	3.79	4.22	4.14	4.78	4.20	4.43
Exp. Gr. II	M	9.5	9.5	9.5	7.7	11.3	10.1	8.9	10.9	9.8
	SD	4.18	0.71	3.55	6.66	2.81	4.40	4.78	2.53	3.91
Control Gr.	M	10.0	13.3	11.4	7.0	12.3	10.5	8.9	12.7	11.0
	SD	4.06	7.14	5.50	5.29	4.03	4.93	4.45	5.12	5.09
Total	M	10.1	12.0	10.7	7.3	11.5	10.0	9.1	11.6	10.4
	SD	4.22	5.40	4.62	4.66	3.54	4.36	4.49	4.11	4.45

TABLE 43a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON MOTOR ENCODING SUBTEST, ITPA

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	27.61	1	27.61	1.91
Age	57.54	1	57.54	3.98
Treatment	73.74	2	36.87	2.55
Sex x Age	59.49	1	59.49	4.12*
Sex x Treatment	6.42	2	3.21	0.22
Age x Treatment	22.46	2	11.23	0.78
Sex x Age x Treatment	.81	2	.41	0.03
Residual	548.88	38	14.44	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 43b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON MOTOR ENCODING SUBTEST, ITPA, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	11.0	10.0	10.7	6.7	10.0	8.8	9.4	10.0	9.7
	SD	4.53	0.00	3.73	6.51	2.55	4.33	5.37	2.08	4.05
Exp. Gr. II	M	9.7	9.0	9.5	7.0	10.7	9.4	8.8	10.3	9.5
	SD	2.88	0.00	2.45	6.25	1.51	3.81	4.09	1.49	3.15
Control Gr.	M	12.2	13.8	12.9	7.3	14.3	12.0	10.4	14.1	12.4
	SD	1.92	4.99	3.44	3.22	4.80	5.41	3.38	4.61	4.42
Total	M	10.9	11.6	11.1	7.0	11.8	10.1	9.5	11.7	10.6
	SD	3.22	4.00	3.43	4.80	3.67	4.62	4.21	3.69	4.08

TABLE 44a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF WORDS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	3194.59	1	3194.59	0.45
Age	1355.38	1	1355.38	0.19
Treatment	7481.63	2	3740.82	0.53
Sex x Age	9998.54	1	9998.54	1.41
Sex x Treatment	6963.86	2	3481.93	0.49
Age x Treatment	4285.55	2	2142.78	0.30
Sex x Age x Treatment	4220.17	2	2110.09	0.30
Residual	269,819.62	38	7100.52	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$

**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 44b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF WORDS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	91.4	65.0	83.9	78.0	73.2	75.0	86.4	70.9	79.1
	SD	85.21	50.91	73.74	36.51	45.68	39.74	67.66	42.89	56.05
Exp. Gr. II	M	103.2	96.0	101.4	81.7	122.7	109.0	96.0	116.0	105.4
	SD	113.17	94.75	102.18	29.67	113.52	93.25	91.32	103.15	94.50
Control Gr.	M	146.0	121.8	135.2	37.7	126.7	97.0	105.4	124.7	116.1
	SD	82.42	72.61	74.41	31.09	92.79	87.19	85.45	80.91	81.05
Total	M	112.9	101.1	109.0	65.8	109.5	94.4	95.9	106.8	113.7
	SD	92.59	67.35	83.69	35.24	88.47	76.53	79.40	80.97	83.56

TABLE 45a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	35,084.93	1	35,084.93	1.85
Age	355.25	1	355.25	0.02
Treatment	14,680.25	2	7,340.13	0.39
Sex x Age	21,094.62	1	21,094.62	1.11
Sex x Treatment	79,063.40	2	39,531.70	2.09
Age x Treatment	33,267.15	2	16,633.58	0.88
Sex x Age x Treatment	25,990.78	2	12,995.39	0.69
Residual	719,388.63	38	18,931.28	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 45b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	26.8	18.0	24.3	29.0	21.4	24.3	27.6	20.4	24.3
	SD	19.29	2.83	16.37	3.46	9.24	8.23	14.75	7.81	12.19
Exp. Gr. II	M	28.2	28.0	28.1	23.7	26.7	25.7	26.7	27.0	26.8
	SD	17.43	19.80	16.52	8.96	14.62	12.49	14.66	14.46	14.11
Control Gr.	M	39.8	33.8	37.1	11.7	27.8	22.4	29.3	30.2	29.8
	SD	15.66	11.09	13.37	6.43	12.32	13.06	19.08	11.60	14.88
Total	M	31.4	28.4	30.4	21.4	25.5	24.1	27.8	26.4	27.1
	SD	17.34	12.54	15.68	9.62	11.98	11.19	15.57	11.97	13.76

TABLE 46a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF RESPONSES IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	136.07	1	136.07	1.58
Age	215.20	1	215.20	2.50
Treatment	298.82	2	149.41	1.74
Sex x Age	7.22	1	7.22	0.08
Sex x Treatment	1105.48	2	552.74	6.42**
Age x Treatment	292.04	2	146.02	1.70
Sex x Age x Treatment	47.16	2	23.58	0.27
Residual	3271.55	38	86.09	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 46b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF RESPONSES IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	22.6	11.0	19.3	30.3	18.2	22.8	25.5	16.1	21.1
	SD	14.01	7.07	13.09	5.03	7.23	8.99	11.64	7.78	10.82
Exp. Gr. II	M	22.3	21.5	22.1	21.7	19.0	19.9	22.1	19.6	20.9
	SD	8.80	10.61	8.46	6.03	6.07	5.82	7.59	6.61	7.04
Control Gr.	M	36.2	32.8	34.7	16.0	19.8	18.6	28.6	25.0	26.6
	SD	16.11	6.99	12.31	4.36	5.78	5.41	16.22	8.91	12.40
Total	M	26.8	24.5	26.0	22.7	19.1	20.3	25.3	20.8	23.0
	SD	13.81	11.74	12.94	7.70	6.11	6.78	11.96	8.47	10.50

TABLE 47a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF UNTRANSLATABLE SYLLABLES IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	18.55	1	18.55	0.08
Age	1474.55	1	1474.55	6.09*
Treatment	291.68	2	145.84	0.60
Sex x Age	46.76	1	46.76	0.19
Sex x Treatment	532.21	2	266.11	1.10
Age x Treatment	41.69	2	20.85	0.09
Sex x Age x Treatment	559.42	2	279.71	1.15
Residual	9202.62	38	242.17	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 47b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF UNTRANSLATABLE SYLLABLES IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	9.6	1.0	7.1	19.0	5.6	10.6	13.1	4.3	9.0
	SD	14.93	1.41	12.90	13.89	6.19	11.19	14.36	5.56	11.71
Exp. Gr. II	M	11.3	12.0	11.5	27.0	6.7	13.4	16.6	8.0	12.5
	SD	14.88	7.07	12.86	35.60	7.12	21.26	22.73	7.03	17.30
Control Gr.	M	29.2	8.3	19.9	14.3	6.7	9.2	23.6	7.3	14.6
	SD	30.09	5.12	24.17	3.51	4.50	5.52	24.08	4.55	17.87
Total	M	16.4	7.4	13.4	20.1	6.4	11.1	17.7	6.7	12.2
	SD	21.33	6.07	18.07	19.97	5.66	13.88	20.51	5.68	15.90

Table 46, which shows the analysis of the total number of responses (i.e., the number of times the child responded to a comment by the examiner during the recorded interview), reveals a significant sex and treatment interaction at the .01 level. The boys in the control group responded more than boys in either experimental group; however, for girls the experimental treatments seemed to produce more responses than control though differences were negligible among the four-year-old girls.

A significant age main effect difference was found in the number of untranslatable syllables between the three-year-olds and the four-year-olds, as shown in Table 47. The three-year-olds, as would be expected, scored higher than the four-year-olds.

The content portion of the VLST Language Structure and Content subtest attempted to analyze the number of each of the various patterns of communication units spoken by the children (e.g., subject-intransitive verb, subject-verb-direct object). The analyses of these various patterns of communication units are contained in Tables 48, 49, 50, 51, 52, 53, 54, 55, and 56.

The summary analyses of the subject-intransitive verb or subject-linking verb pattern (1 2 or 1②) in Table 48, the subject-verb-direct object pattern (1 2 4) in Table 49, the subject-linking verb-linking verb complement pattern (1②5) in Table 50, the subject-linking verb-subject pattern ((1)②1) in Table 52, the question pattern in Table 53, the passive pattern in Table 54, and the request and command pattern of communication unit in Table 55 reveal no significant differences.

TABLE 48a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF 1 2 or 1② COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	6.27	1	6.27	0.20
Age	.46	1	.46	0.01
Treatment	23.30	2	11.65	0.37
Sex x Age	33.64	1	33.64	1.06
Sex x Treatment	3.76	2	1.88	0.06
Age x Treatment	26.60	2	13.30	0.42
Sex x Age x Treatment	6.79	2	3.40	0.11
Residual	1202.12	38	31.63	

*F(1,38) $\geq$ 4.10 or F(2,38) $\geq$ 3.25 $p < .05$
**F(1,38) $\geq$ 7.36 or F(2,38) $\geq$ 5.23 $p < .01$

TABLE 48b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF 1 2 or 1② COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	5.4	3.0	4.7	4.3	3.6	3.9	5.0	3.4	4.3
	SD	6.89	4.24	5.99	1.53	2.61	2.17	5.29	2.76	4.23
Exp. Gr. II	M	7.3	4.5	6.6	4.0	6.8	5.9	6.2	6.3	6.2
	SD	10.50	0.71	8.98	4.58	4.75	4.62	8.77	4.17	6.79
Control Gr.	M	6.2	6.8	6.4	3.0	6.8	5.6	5.0	6.8	6.0
	SD	3.27	3.30	3.09	3.61	5.57	5.13	3.55	4.57	4.13
Total	M	6.4	5.3	6.0	3.8	5.9	5.1	5.4	5.7	5.6
	SD	7.27	3.20	6.16	3.07	4.55	4.16	6.15	4.11	5.18

TABLE 49a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF 1 2 4 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	6.41	1	6.41	0.17
Age	7.57	1	7.57	0.20
Treatment	29.08	2	14.54	0.39
Sex x Age	105.88	1	105.88	2.84
Sex x Treatment	9.12	2	4.56	0.12
Age x Treatment	5.55	2	2.78	0.07
Sex x Age x Treatment	30.51	2	15.26	0.41
Residual	1417.23	38	37.30	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 49b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF 1 2 4 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	5.0	4.0	4.7	3.0	3.6	3.4	4.3	3.7	4.0
	SD	4.64	4.24	4.19	2.65	3.36	2.93	3.92	3.25	3.51
Exp. Gr. II	M	6.0	3.5	5.4	2.7	7.8	6.1	4.9	6.8	5.8
	SD	7.56	3.54	6.63	1.53	9.77	8.18	6.25	8.60	7.27
Control Gr.	M	8.4	5.0	6.9	2.0	8.2	6.1	6.0	6.9	6.5
	SD	6.47	4.55	5.65	2.65	6.80	6.33	6.07	5.93	5.83
Total	M	6.4	4.4	5.8	2.6	6.7	5.3	5.0	6.0	5.5
	SD	6.16	3.70	5.47	2.07	7.17	6.19	5.37	6.28	5.80

TABLE 50a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF 1②5 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	7.21	1	7.21	2.07
Age	.47	1	.47	0.13
Treatment	1.95	2	.98	0.28
Sex x Age	.91	1	.91	0.26
Sex x Treatment	3.13	2	1.57	0.45
Age x Treatment	4.68	2	2.34	0.67
Sex x Age x Treatment	13.96	2	6.98	2.00
Residual	132.65	38	3.49	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 50b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF 1②5 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	1.4	3.0	1.9	0.3	1.0	0.8	1.0	1.6	1.3
	SD	1.95	4.24	2.48	0.58	1.73	1.39	1.60	2.44	1.98
Exp. Gr. II	M	1.0	1.0	1.0	1.3	0.3	0.7	1.1	0.5	0.8
	SD	1.55	0.00	1.31	1.16	0.82	1.00	1.36	0.76	1.13
Control Gr.	M	2.6	0.8	1.8	0.0	1.8	1.2	1.6	1.4	1.5
	SD	3.44	0.96	2.68	0.00	1.94	1.79	2.93	1.65	2.23
Total	M	1.6	1.4	1.54	0.6	1.1	0.89	1.2	1.2	1.2
	SD	2.34	2.00	2.19	0.88	1.60	1.40	1.99	1.70	1.83

TABLE 51a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF 1 2 3 4 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.71	1	.71	4.35*
Age	.65	1	.65	3.97
Treatment	1.44	2	.72	4.45*
Sex x Age	.39	1	.39	2.38
Sex x Treatment	.90	2	.45	2.77
Age x Treatment	1.88	2	.94	5.82**
Sex x Age x Treatment	1.25	2	.63	3.86*
Residual	6.13	38	.16	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 51b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF 1 2 3 4 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exp. Gr. II	M	0.0	0.0	0.4	0.0	0.2	0.1	0.0	0.5	0.2
	SD	0.00	0.00	1.06	0.00	0.41	0.33	0.00	1.07	0.75
Control Gr.	M	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1
	SD	0.45	0.00	0.33	0.00	0.00	0.00	0.35	0.00	0.24
Total	M	0.1	0.4	0.2	0.0	0.1	0.04	0.04	0.2	0.1
	SD	0.25	1.06	0.64	0.00	0.24	0.20	0.20	0.62	0.46

TABLE 52a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF (1)②1 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.08	1	.08	0.46
Age	.03	1	.03	0.17
Treatment	.26	2	.13	0.75
Sex x Age	.00	1	.00	0.00
Sex x Treatment	.33	2	.17	0.98
Age x Treatment	.72	2	.36	2.11
Sex x Age x Treatment	.62	2	.62	1.82
Residual	6.52	38	.17	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 $p < .05$
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 $p < .01$

TABLE 52b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF (1)②1 COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.2	0.0	0.1	0.0	0.00	0.0	0.1	0.0	0.07
	SD	0.45	0.00	0.38	0.00	0.00	0.00	0.35	0.00	0.26
Exp. Gr. II	M	0.0	0.0	0.0	0.67	0.0	0.2	0.2	0.0	0.12
	SD	0.00	0.00	0.00	0.58	0.00	0.44	0.44	0.00	0.33
Control Gr.	M	0.2	0.25	0.2	0.0	0.5	0.3	0.1	0.4	0.28
	SD	0.45	0.50	0.44	0.00	0.84	0.71	0.35	0.70	0.58
Total	M	0.1	0.1	0.13	0.2	0.2	0.19	0.16	0.16	0.16
	SD	0.34	0.35	0.34	0.44	0.53	0.49	0.37	0.47	0.42

TABLE 53a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF QUESTIONS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.23	1	.23	0.09
Age	2.04	1	2.04	0.82
Treatment	.92	2	.46	0.19
Sex x Age	.68	1	.68	0.28
Sex x Treatment	3.81	2	1.91	0.77
Age x Treatment	1.00	2	.50	0.20
Sex x Age x Treatment	.01	2	.01	0.00
Residual	94.42	38	2.48	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 53b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF QUESTIONS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.8	0.5	0.7	1.33	0.6	0.9	1.0	0.6	0.8
	SD	0.84	0.71	0.76	2.31	0.89	1.46	1.41	0.79	1.15
Exp. Gr. II	M	1.0	0.5	0.9	2.0	1.0	1.3	1.3	0.9	1.1
	SD	0.89	0.71	0.84	3.46	1.67	2.24	1.94	1.46	1.69
Control Gr.	M	1.0	1.3	1.1	0.7	0.3	0.4	0.9	0.7	0.8
	SD	1.73	2.50	1.97	1.16	0.52	0.73	1.46	1.57	1.48
Total	M	0.9	0.9	0.92	1.3	0.7	0.89	1.08	0.72	0.9
	SD	1.12	1.73	1.32	2.24	1.12	1.58	1.58	1.31	1.45

TABLE 54a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF PASSIVE COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.00	1	.00	0.00
Age	.03	1	.13	0.13
Treatment	.12	2	.06	0.30
Sex x Age	.12	1	.12	0.58
Sex x Treatment	.96	2	.48	2.35
Age x Treatment	.43	2	.22	1.29
Sex x Age x Treatment	.39	2	.20	0.96
Residual	7.80	38	.21	

$^{*}F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
$^{**}F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 54b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF PASSIVE COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.0	0.0	0.0	0.67	0.2	0.4	0.3	0.1	0.2
	SD	0.00	0.00	0.00	1.16	0.45	0.74	0.71	0.38	0.56
Exp. Gr. II	M	0.33	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.12
	SD	0.52	0.00	0.46	0.00	0.00	0.00	0.44	0.00	0.33
Control Gr.	M	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.2	0.11
	SD	0.00	1.00	0.67	0.00	0.00	0.00	0.00	0.63	0.47
Total	M	0.1	0.3	0.17	0.2	0.1	0.12	0.16	0.12	0.14
	SD	0.34	0.71	0.48	0.67	0.24	0.43	0.47	0.44	0.45

TABLE 55a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF REQUESTS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	.32	1	.32	0.55
Age	.04	1	.04	0.07
Treatment	.41	2	.21	0.36
Sex x Age	.61	1	.61	1.05
Sex x Treatment	.06	2	.03	0.05
Age x Treatment	.09	2	.05	0.08
Sex x Age x Treatment	.37	2	.19	0.32
Residual	22.17	38	.58	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 55b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF REQUESTS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	0.2	0.0	0.1	0.33	0.40	0.4	0.3	0.3	0.27
	SD	0.45	0.00	0.38	0.58	0.89	0.74	0.46	0.76	0.59
Exp. Gr. II	M	0.33	0.0	0.3	0.0	0.67	0.4	0.2	0.5	0.35
	SD	0.82	0.00	0.71	0.00	1.63	1.33	0.67	1.41	1.06
Control Gr.	M	0.0	0.0	0.0	0.0	0.17	0.1	0.0	0.1	0.06
	SD	0.00	0.00	0.00	0.00	0.41	0.33	0.00	0.32	0.24
Total	M	0.2	0.0	0.13	0.1	0.4	0.31	0.16	0.28	0.22
	SD	0.54	0.00	0.45	0.33	1.06	0.88	0.47	0.89	0.71

TABLE 56a

THREE-WAY ANALYSIS OF VARIANCE OF NUMBER OF PARTIAL COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	131.43	1	131.43	3.10
Age	32.80	1	32.80	0.77
Treatment	12.78	2	6.39	0.15
Sex x Age	4.42	1	4.42	0.10
Sex x Treatment	493.98	2	246.99	5.82**
Age x Treatment	151.97	2	75.99	1.79
Sex x Age x Treatment	78.94	2	39.47	0.93
Residual	1613.32	38	42.46	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 56b

MEANS AND STANDARD DEVIATIONS OF NUMBER OF PARTIAL COMMUNICATION UNITS IN LANGUAGE STRUCTURE AND CONTENT SUBTEST, VLST NO. VIII, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	13.8	7.5	12.0	19.0	11.0	14.0	15.8	10.0	13.1
	SD	9.89	10.61	9.6	4.00	3.16	5.24	8.21	5.32	7.39
Exp. Gr. II	M	12.2	16.5	13.3	13.0	9.8	10.9	12.4	11.5	12.0
	SD	6.40	12.02	7.34	3.00	4.26	4.01	5.29	6.57	5.76
Control Gr.	M	20.6	19.3	20.0	6.0	10.0	8.7	15.1	13.7	14.3
	SD	11.08	4.27	8.29	1.00	2.61	2.92	11.29	5.72	8.39
Total	M	15.3	15.6	15.4	12.7	10.2	11.1	14.4	11.96	13.16
	SD	9.29	8.43	8.83	6.19	3.25	4.52	8.27	5.86	7.20

Table 51 contains a summary of analysis on the subject-verb-indirect object-direct object pattern of communication unit. This table reveals significant sex and treatment main effect differences at the .05 level. A significant age and treatment interaction is apparent at the .01 level, while a significant interaction of sex, age, and treatment is indicated at the .05 level. An investigation of the mean scores shows zero scores in all cases except for the four-year-old girls in Experimental Group II and the three-year-old boys in the control group. Experimental Group II scored higher than the control group. Even though significant differences are apparent in this type of communication unit, it should be noted that these results are largely based on the scores of only three children who scored higher than zero, one in the control group and two in Experimental Group II. Therefore, the assumption of normal distribution is seriously violated.

In Table 56 the analysis of the partial (or incomplete communication unit) pattern of communication unit is summarized. Overall, the children in all groups scored more partials than any other type of communication unit. A significant sex and treatment interaction at the .01 level is evident in this table. The boys in the control group scored more partials than the boys in either of the experimental groups; however, the girls in the experimental groups scored more partials than the girls in the control group. The experimental treatments appeared on this one criterion to be effective for girls, but ineffective for boys. Since this particular interaction was not hypothesized in advance, the possibility remains that chance occurrences produced it. Confirmation in subsequent research would be necessary before making any firm conclusions.

An investigation of all language subtests under Language Goal No. 4 indicates that Hypothesis No. 1 was not confirmed.

Analyses of total raw scores were performed on the six ITPA subtests combined and the first seven subtests of the VLST combined. Even though these analyses do not directly test any specific language goal, it is interesting to note the results. The ITPA total raw score summary in Table 57 and the VLST total raw score summary in Table 58 both reveal significant age main effect differences at the .01 level. In both cases four-year-olds scored higher than three-year-olds.

It can be said after examination of all language subtests under all four language goals that Hypothesis 1 was not confirmed in this study.

Analysis of Data Relative to Hypothesis 2

The attainment of each social competency goal in this study was measured in turn by a separate subtest in the Cain-Levine Social Competency Scale. This scale was completed by the mother or guardian of each child in the study.

TABLE 57a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES (SIX SUBTESTS)

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	373.72	1	373.72	1.61
Age	2557.73	1	2557.73	11.91**
Treatment	562.98	2	281.49	1.22
Sex x Age	557.51	1	557.51	2.41
Sex x Treatment	210.55	3	106.38	0.45
Age x Treatment	55.03	2	28.52	0.12
Sex x Age x Treatment	43.65	2	21.83	0.09
Residual	8798.60	38	231.54	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 57b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES (SIX SUBTESTS) BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	59.6	74.0	63.7	43.0	66.0	57.4	53.4	68.3	60.3
	SD	14.93	9.90	14.64	27.2	12.12	20.91	20.32	11.38	17.92
Exp. Gr. II	M	53.5	58.0	54.6	43.0	64.5	57.3	50.0	62.9	56.1
	SD	8.29	2.83	7.39	30.81	11.29	30.80	17.54	10.06	15.6
Control Gr.	M	61.2	68.8	64.6	49.0	74.2	65.8	56.6	72.0	65.2
	SD	17.30	16.11	16.21	14.53	9.54	16.37	16.46	12.04	15.82
Total	M	57.8	67.4	61.0	45.0	68.4	60.3	53.2	68.0	60.6
	SD	13.21	12.85	13.61	22.00	11.18	19.06	17.60	11.48	16.51

TABLE 58a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES, SUBTESTS I THROUGH VII, VLST

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	6.97	1	6.97	1.01
Age	59.91	1	59.91	8.77**
Treatment	10.78	2	5.39	0.79
Sex x Age	.09	1	.09	0.01
Sex x Treatment	6.81	2	3.41	0.50
Age x Treatment	6.26	2	3.13	0.46
Sex x Age x Treatment	2.88	2	1.44	0.21
Residual	259.47	38	6.83	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 58b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES, SUBTESTS I THROUGH VII, VLST, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	118.6	144.0	125.9	107.3	125.0	118.4	114.4	130.4	121.9
	SD	6.66	4.24	13.64	37.58	28.73	31.00	21.51	25.3	23.96
Exp. Gr. II	M	100.5	120.0	105.4	95.3	134.8	121.7	98.8	131.1	114.0
	SD	26.17	14.14	24.48	47.59	19.39	34.5	31.64	18.55	30.46
Control Gr.	M	123.2	140.8	131.0	110.3	123.7	119.2	118.4	130.5	125.1
	SD	28.01	21.99	25.68	27.39	24.47	24.62	26.59	23.91	25.14
Total	M	113.3	136.4	120.96	104.3	128.0	119.8	110.04	130.7	120.36
	SD	23.60	18.51	24.32	33.97	23.20	29.08	27.42	21.79	26.63

Social Competency Goal No. 1: The ability to carry out manipulative self-help skills.--The Self-Help (SH) subscale of the CLSCS was used to measure this social competency goal. Table 59 shows the summary of the analysis of this subtest. No significant differences were found. Therefore, Hypothesis No. 2 was not confirmed with respect to this social learning goal.

Social Competency Goal No. 2: The ability for self-direction in socially desirable behavior.--The attainment of this objective was measured by the Initiative (I) subtest of the CLSCS. The analysis of this subtest in Table 60 reveals no significant differences. It seems apparent that Hypothesis 2 was not confirmed in relation to this social competency objective.

Social Competency Goal No. 3: The ability to engage in socially appropriate interpersonal relationships with other children and adults.--This objective was measured by the Social Skills (SS) subtest of the CLSCS. The analysis of this test is summarized in Table 61. No significant differences were found. Hypothesis 2 relating to this social competency goal, therefore, was not confirmed.

Social Competency Goal No. 4: The ability to communicate verbally with other children and adults.--The achievement of this goal was measured by the Communication (C) subtest of the CLSCS. The summary of analysis on this subtest is contained in Table 62. Again, no significant differences were found. Therefore, Hypothesis 2 was not confirmed in relation to this social competency goal.

TABLE 59a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON SELF HELP SUBSCALE OF CLSCS

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	3.98	1	3.98	0.05
Age	146.89	1	146.89	1.71
Treatment	79.00	2	39.50	0.46
Sex x Age	2.60	1	2.60	0.03
Sex x Treatment	31.62	2	31.62	0.18
Age x Treatment	13.94	2	13.94	0.08
Sex x Age x Treatment	4.21	2	2.11	0.02
Residual	3262.29	38	85.85	

*F(1,38) ≥ 4.10 or F(2,38) ≥ 3.25 p < .05
**F(1,38) ≥ 7.36 or F(2,38) ≥ 5.23 p < .01

TABLE 59b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON SELF HELP SUBSCALE OF CLSCS, BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	38.2	43.0	39.6	34.7	40.4	38.3	36.9	41.1	38.9
	SD	7.09	2.83	6.35	5.51	6.35	6.36	6.38	5.46	6.16
Exp. Gr. II	M	36.8	38.0	37.1	36.0	39.7	38.4	36.6	39.3	37.8
	SD	6.74	1.41	5.74	10.58	18.05	15.33	7.52	15.29	11.51
Control Gr.	M	38.6	42.3	40.2	39.7	42.8	41.8	39.0	42.6	41.0
	SD	10.90	4.27	8.36	3.22	6.31	5.47	8.44	5.32	6.90
Total	M	37.8	41.4	39.0	36.8	41.0	39.5	37.4	41.1	39.3
	SD	7.80	3.70	6.84	6.57	11.24	9.95	7.26	9.40	8.51

TABLE 60a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON INITIATIVE SUBSCALE OF CLSCS

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	2.07	1	2.07	0.11
Age	24.35	1	1.28	1.28
Treatment	18.59	2	9.30	0.49
Sex x Age	9.03	1	9.03	0.47
Sex x Treatment	117.17	2	58.59	3.07
Age x Treatment	11.90	2	5.95	0.31
Sex x Age x Treatment	17.28	2	8.64	0.45
Residual	724.54	38	19.07	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 60b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON INITIATIVE SUBSCALE OF CLSCS BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	28.6	28.0	28.4	25.3	27.6	26.8	27.4	27.7	27.5
	SD	5.94	5.66	5.38	2.31	2.97	2.82	4.96	3.35	4.14
Exp. Gr. II	M	26.3	25.0	26.0	28.3	31.2	30.2	27.0	29.6	28.2
	SD	5.82	2.83	5.07	0.58	1.60	1.92	4.72	3.34	4.22
Control Gr.	M	28.8	32.5	30.4	26.0	28.2	27.4	27.8	29.9	28.9
	SD	6.18	5.26	5.77	3.00	3.49	3.32	5.15	4.58	4.82
Total	M	27.8	29.5	28.4	26.6	29.1	28.2	27.4	29.2	28.3
	SD	5.68	5.40	5.53	2.35	3.07	3.05	4.73	3.85	4.37

TABLE 61a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON SOCIAL SKILLS SUBSCALE OF CLSCS

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	104.01	1	104.01	2.99
Age	115.46	1	115.46	3.32
Treatment	4.92	2	2.46	0.07
Sex x Age	2.34	1	2.34	0.07
Sex x Treatment	9.00	2	4.50	0.13
Age x Treatment	7.37	2	3.69	0.11
Sex x Age x Treatment	28.82	2	14.41	0.41
Residual	1323.47	38	34.83	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 61b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON SOCIAL SKILLS SUBSCALE OF CLSCS BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	29.2	31.0	29.7	22.3	29.4	26.8	26.6	29.9	28.1
	SD	4.87	1.41	4.11	2.89	2.88	4.53	5.34	2.55	4.45
Exp. Gr. II	M	26.7	29.5	27.4	24.7	27.7	26.7	26.0	28.1	27.0
	SD	4.93	6.36	4.98	6.03	9.99	8.59	5.03	8.82	6.92
Control Gr.	M	27.2	31.0	28.9	25.3	26.5	26.1	26.5	28.3	27.5
	SD	6.06	3.37	5.16	0.58	7.23	5.75	4.69	6.18	5.49
Total	M	27.6	30.6	28.6	24.1	27.8	26.5	26.4	28.7	27.5
	SD	5.05	3.38	4.71	3.6	7.15	6.33	4.82	6.26	5.65

TABLE 62a

THREE-WAY ANALYSIS OF VARIANCE OF RAW SCORES ON COMMUNICATION SUBSCALE OF CLSCS

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	11.41	1	11.41	0.63
Age	8.43	1	8.43	0.47
Treatment	1.60	2	.80	0.04
Sex x Age	14.42	1	14.42	0.80
Sex x Treatment	23.49	2	11.75	0.65
Age x Treatment	71.69	2	35.85	2.00
Sex x Age x Treatment	3.88	2	1.94	0.11
Residual	684.89	38	18.02	

*$F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
**$F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 62b

MEANS AND STANDARD DEVIATIONS OF RAW SCORES ON COMMUNICATION SUBSCALE OF CLSCS BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	33.8	36.5	34.6	30.0	35.8	33.6	32.4	36.0	34.1
	SD	3.96	0.71	3.51	7.21	1.64	5.04	5.26	1.41	4.27
Exp. Gr. II	M	34.2	33.0	33.9	33.7	35.7	35.0	34.0	35.0	34.5
	SD	4.36	0.00	3.72	4.73	6.09	5.45	4.18	5.29	4.61
Control Gr.	M	36.6	34.3	35.6	34.3	32.7	33.2	35.8	33.3	34.4
	SD	3.05	2.36	2.88	3.22	4.63	4.09	3.11	3.80	3.63
Total	M	34.8	34.5	34.7	32.7	34.6	34.0	34.0	34.6	34.3
	SD	3.82	2.07	3.29	5.03	4.61	4.75	4.32	3.93	4.09

An investigation of Tables 59, 60, 61, and 62, which summarize the analyses of the individual subtests of the Cain-Levine Social Competency Scale, reveals evidence that Hypothesis 2 was not confirmed in this study.

The total raw scores on the Cain-Levine Social Competency Scale were also analyzed. This analysis is shown in Table 63. No significant differences were found.

The statistical analysis of the data in this study was done with the assistance of the Stanford Computation Center. These programs are on tape and located in the Computer Science Library at Stanford University.

TABLE 63a

THREE-WAY ANALYSIS OF VARIANCE OF TOTAL RAW SCORES ON CAIN-LEVINE SOCIAL COMPETENCY SCALE

Source	Sum of Squares	DF	Mean Square	F-Ratio
Sex	3.38	1	3.38	0.68
Age	6.40	1	6.40	1.29
Treatment	3.70	2	1.85	0.37
Sex x Age	.02	1	.02	0.01
Sex x Treatment	2.78	2	1.39	0.28
Age x Treatment	3.33	2	1.67	0.34
Sex x Age x Treatment	.23	2	.12	0.02
Residual	189.07	38	4.98	

$^{*}F(1,38) \geq 4.10$ or $F(2,38) \geq 3.25$ $p < .05$
$^{**}F(1,38) \geq 7.36$ or $F(2,38) \geq 5.23$ $p < .01$

TABLE 63b

MEANS AND STANDARD DEVIATIONS OF TOTAL RAW SCORES ON CAIN-LEVINE SOCIAL COMPETENCY SCALE BY TREATMENT, SEX, AND AGE

Treatment		Boys			Girls			Both Sexes		
		Age 3	Age 4	Total	Age 3	Age 4	Total	Age 3	Age 4	Total
Exp. Gr. I	M	127.8	138.5	130.9	112.3	133.2	125.4	122.0	134.7	127.9
	SD	19.46	9.19	17.14	11.50	9.50	14.35	17.84	9.00	15.39
Exp. Gr. II	M	124.2	125.5	124.5	122.7	127.3	125.8	123.7	126.9	125.2
	SD	14.85	2.12	12.59	20.6	46.67	38.38	15.64	39.5	28.4
Control Gr.	M	131.2	140.0	135.1	125.3	129.5	128.1	129.0	133.7	131.6
	SD	22.82	10.17	17.91	7.23	17.79	14.67	17.94	15.48	16.28
Total	M	127.5	136.0	130.3	120.1	129.8	126.5	124.8	131.8	128.3
	SD	17.96	9.97	16.04	13.70	28.4	24.48	16.65	24.0	20.75

CHAPTER V

SUMMARY AND IMPLICATIONS

Purpose of the Study

The purpose of this study was to investigate the degree to which a preschool educational program would make a significant difference in the language skills and social competency of three-year-old and four-year-old disadvantaged children.

The specific hypotheses tested were:

1. The language skills scores of disadvantaged three-year-old and four-year-old children exposed to a preschool educational program for seven months will be higher than those of a comparable group who remain in the home environment during the same period of time.

2. The social competency scores of disadvantaged three-year-old and four-year-old children exposed to a preschool educational program for seven months will be higher than those of a comparable group who remain in the home environment during the same period of time.

Theoretical Rationale

The theoretical assumptions used as the bases for this study were:

1. The human organism is malleable and development is not predetermined.

2. Language and social skills can be changed by environmental forces.

3. Social intervention in the lives of children is more effective in the early years than in the later years.

Inference was made from these assumptions that a preschool educational program designed around specific language and social skills goals could be implemented to significantly increase these skills in three-year-old and four-year-old children.

Sample

The original sample consisted of 57 three-year-old and four-year-old children from families on Aid to Families with Dependent Children (AFDC) living in the adjacent communities of Fremont and Newark, California. The mothers of all children in the sample had made application for their children to attend the preschool educational program in Fremont Unified School District. Each applicant child was placed in one of four groups according to age and sex. Subsequently, each subject was randomly assigned to one of two preschool classes (Experimental Groups I and II) or the control group (children who did not attend preschool). Eighteen students each were assigned to the experimental groups; 21 children were assigned to the control group.

Before testing began a total of four children dropped out of the experimental groups; three children in the control group were not available for testing. The total attrition was seven children. There were 5 three-year-old boys, 2 four-year-old boys, 3 three-year-old girls, and 5 four-year-old girls in Experimental Group I for a total of 15 children. Experimental Group II had 6 three-year-old boys, 2 four-year-old boys, 3 three-year-old girls and 6 four-year-old girls, or a total of 17 children. There were 5 three-year-old boys, 4 four-year-old boys, 3 three-year-old girls, and 6 four-year-old girls in the control group, for a total of 18 children. There were 24 boys and 26 girls in the final testing sample, with 25 children three years old and 25 children four years old.

All the children participating in the study were English-speaking children, even though 14 of the 50 children were of Mexican-American racial background. All children were white.

Experimental Treatment

The experimental treatment consisted of a seven-month preschool educational program with special curriculum emphasis on four language goals and four social competency goals. A head teacher and a teacher aide were assigned to each experimental group. The two experimental groups met daily in separate schools in shared kindergarten rooms from 12 noon to 4:00 p.m. Specific experiences in such curriculum topic areas as families or food were planned for the children to achieve the language and social objectives. The children in the control group remained in the home environment. No contact was made with them until the testing began.

Criterion Measures

Form A of the Peabody Picture Vocabulary Test, six subtests of the Illinois Test of Psycholinguistic Abilities, and the eight subtests in the Vance Language Skills Test (a language instrument developed by the investigator) were administered to all children in the experimental and control groups. Two testing sessions were required for each child. During one of the testing sessions each child's mother or guardian filled out the Cain-Levine Social Competency Scale. Five examiners tested the children in their homes by randomly-assigned appointments. The examiners were not informed during testing that a study was being made.

Results

Hypothesis 1.--A three-way analysis of variance over age, sex, and treatment on the results of Form A of the Peabody Picture Vocabulary Test, six subtests of the Illinois Test of Psycholinguistic Abilities, and the eight subtests of the Vance Language Skills Test showed the following:

1. Language Goal No. 1:--The subjects exposed to the experimental treatment did not have significantly higher language skills scores than those who remained in the home. The mean scores were in favor of the control group on both subtests used to measure the achievement of this goal, the Peabody Picture Vocabulary Test and the Labeling subtest from the Vance Language Skills Test.

2. Language Goal No. 2:--Scores of the subjects exposed to the experimental treatment were not significantly higher on the three subtests measuring this goal than the children who remained at home. The three subtests used to measure the achievement of this goal were the Speech Sound Discrimination, the Environmental Sound Identification, and the Environmental Sound Labeling subtests of the Vance Language Skills Test.

3. Language Goal No. 3:--Children in the experimental treatment did not have significantly higher scores on the seven language subtests measuring this goal than children in the control group. The seven subtests used to measure the

achievement of this goal were the Visual Decoding, the Visual-Motor Association, the Auditory-Vocal Association, and the Auditory-Vocal Automatic subtests of the Illinois Test of Psycholinguistic Abilities; and the Percepts and Concepts, the Spatial Relations A, and the Spatial Relations B subtests of the Vance Language Skills Test.

4. Language Goal No. 4.--The children exposed to the experimental treatment did not score significantly higher on the three language subtests used to measure the attainment of this goal than the children remaining in the home environment. Mean scores favored the control group on the Vocal Encoding and Motor Encoding subtests of the Illinois Test of Psycholinguistic Abilities, and in the words, communication units, responses, and syllables portions of the Language Structure and Content subtest of the Vance Language Skills Test.

   A sex x treatment interaction at the .01 level was found in the responses and partials portions of the Language and Content subtest of the Vance Language Skills Test. The boys in the control group responded more than the boys in either experimental group and scored more partials; however, for girls the experimental treatments seemed to produce more responses and partials than the control.

Hypothesis 2.--A three-way analysis of variance over age, sex, and treatment on the results of the Cain-Levine Social Competency Scale revealed the following:

1. Social Competency Goal No. 1:--The experimental subjects did not have significantly higher scores on the Self-Help subscale of the Cain-Levine Social Competency Scale than children who remained in the home environment. Though not significant, the mean score of the control group was higher than that of either of the experimental groups.

2. Social Competency Goal No. 2:--The experimental subjects did not score significantly higher on the Initiative subscale of the Cain-Levine Social Competency Scale than children in the control group. The children in the control group scored higher than those in either of the experimental groups.

3. Social Competency Goal No. 3:--The children exposed to a preschool educational program did not have higher scores on the Social Skills subtest of the Cain-Levine Social Competency Scale than children who remained in the home environment.

4. Social Competency Goal No. 4:--Analysis of scores on the Communication subscale of the Cain-Levine Social Competency Scale showed that children in the experimental treatment did not score significantly higher than children in the control group.

Limitations of the Study

It seems relevant to note the limitations of the study before discussing the conclusions and implications.

First, the children in this study, though disadvantaged as defined by being in a family receiving public assistance funds, were from homes where the mothers were interested enough in the program to make application for their children. Another population of approximately 50 children exists where families are receiving public assistance but whose mothers were not interested enough in the program to make application for their children.

Second, the three-year-old and the four-year-old children were combined in the experimental groups. It was not feasible to plan different experiences for each age group.

Third, neither of the head teachers had had previous experience working with preschool groups of children, nor had they received any formal training in child development or preschool educational planning. They both had elementary teaching credentials and some teaching experience.

Fourth, seven children from the original sample were not available for testing. It is not known what effect the scores of these children would have had on the results of this study.

Fifth, the school rooms used for this experiment were shared kindergartens. Some compromises were necessary in the planned curriculum of the preschool in order to adapt to the schedule and plans of the kindergarten teachers. Poorly developed outdoor play space and lack of storage space prevented the introduction of many planned experiences for the preschool children.

Sixth, the children came from a very broad geographical area. Some children had to travel for long periods daily in a school bus going to and from school. The children may have been too tired after the long drives to benefit from the planned preschool program.

Seventh, the preschool program was conducted in the afternoon. Many three-year-olds, especially, are accustomed to afternoon naps. This, added to a long daily drive, may have prevented many children from gaining the optimum value from the preschool educational program.

Eighth, the average age of the control children was 2-1/2 months older than the average age of the children in either experimental group. This is a chance bias factor favoring the control group.

Ninth, the control group had 56 per cent of its subjects from the Newark area while the experimental groups combined had only 25 per cent of their subjects from the Newark area. Even though this difference in proportion is a chance factor, it may be a factor favoring the control group. Perhaps the home situation, the type of peer group relationships, or the type of verbal environment differ in the two community AFDC preschool populations.

Tenth, although the curriculum was planned around specific language skills and social competency goals the criterion measures may not be specific enough to measure the particular language and social skills taught in the preschool classes.

Eleventh, the tape transcriptions for the Language Structure and Content subtest of the Vance Language Skills Test were scored and coded by the investigator. Bias, therefore, may have entered into the scoring of this subtest.

Twelfth, the curriculum and methods of teaching used in this study may not be the most effective means of teaching language and social competency skills to preschool children. The curriculum revolved largely around free-play experiences, with emphasis on incidental learning. The story and conversation period, the most structured part of the curriculum and considered to be the focal point for the learning of language and social competency skills, was but a small portion of the total in-school experience of the children.

Conclusions

The following conclusion can be drawn from this research:

> The preschool program in this study was not effective in increasing the language skills scores and social competency scores of three-year-old and four-year-old disadvantaged children as measured by tests administered at the end of the program.

From the results of this study, it could not be shown that early intervention of the type attempted in this preschool educational program produces significant behavioral differences in language and social skills in three-year-old and four-year-old children.

Even though the children in this study were defined as "disadvantaged" because they came from a population requiring public assistance funds, their language skills as measured by the two standardized tests used in this study, the Peabody Picture Vocabulary Test and the Illinois Test of Psycholinguistic Abilities, scored on the average above the age norms in every instance. Therefore, the children in this study could not be considered disadvantaged in terms of language skills, at least as measured by the two standardized measures.

Implications

Preschool education today is seen as the panacea for later school failures, particularly for children from low-income families in depressed areas. Variety of experience is seen as the key to school success. This variety seems most obtainable for disadvantaged children in the preschool where trained personnel can provide the experiences deemed most beneficial for preschool children. The results of this study indicate that a rich variety of experience in a preschool group setting for low-income or disadvantaged children, even though carefully planned in terms of behavioral outcomes, is no more beneficial than home and neighborhood experiences. Seemingly this has several implications for preschool education.

First, preschool educators must learn techniques to identify specific learning problems of individual children. It may be a mistake to outline specific behavioral goals for a group of children or develop a curriculum largely around these objectives inasmuch as they may not take into account which learning problems are most crucial to each child. Specific group behavioral goals are probably aids for curricular focus or direction. However, better methods need to be developed for identification of specific learning problems in young children in terms of culturally and subculturally appropriate behavior (Vance, 1965, 1967). After specific learning problems are identified the child's learning experiences can be planned. It may be that preschool group experience may benefit children with certain learning problems but hamper learning of certain skills in other children.

Second, the training of teachers of young children should be re-evaluated. Teachers must not only be trained in the kinds of behavior to expect from preschool children but also in learning theory, methods of identifying learning problems, techniques for environmental intervention for preschoolers in terms of specific learning problems, and means of evaluating the success or failure of specific behavioral modification techniques.

Third, society must be prepared to pay the cost of good preschool education. If learning problems and new skills cannot be handled in the home environment, well-trained staff in adequate numbers, well-planned facilities, and ample materials must be made available in the preschools. Otherwise, children would do well to remain in the home environment.

Fourth, more effective ways must be found to include parents in the education of their preschool children. Children spend more time in the home than at school. There must be stimulus carry-over into the home if preschool group experience is to adequately meet the needs of individual children. There must be agreement between the home and the school regarding the learning goals of the individual children. Then means of teaching the child must be communicated to parents. Parents should then have the opportunity to try out what they learn under adequate and interested supervision. Without parent cooperation in the preschool curriculum, even the best of preschools can become nothing more than babysitting or "holding" situations.

Suggestions for Research

The present study suggests several ideas for further research. These include the following:

1. A follow-up study of the subjects in this study might be done to test for possible latent learning in language and social skills. Furthermore, inasmuch as the four-year-olds in this study will be going into kindergarten the fall of 1967 and the three-year-olds in Fremont will continue preschool while those in Newark will not, such a follow-up study could test the possible carry-over effects of a year of preschool after children have attended a year of kindergarten or another year of preschool or have remained in the home environment.

2. A similar study could be performed with preschool siblings of elementary school students who are failing in school. If results indicate significant differences between experimental and control groups, possible common factors in the home that precipitate school failure could be isolated and teaching techniques developed to counteract such factors.

3. A similar study could be conducted separating the age groups; four-year-olds could be in one class and three-year-olds in a separate class, both taught at the same time each day.

4. Short-term studies could be conducted to test the effectiveness of certain behavioral modification techniques with specific kinds of behavioral objectives on particular children. These could include ways of conducting group conversations around specific concepts, means of teaching particular concepts, and effective types of verbal reinforcement.

APPENDIX A

Fremont Unified School District
611 Olive Avenue
Fremont, California 94538
Phone: 657-3956

APPLICATION
Preschool Educational Program
(This is not an enrollment form)

Today's date ________________

Child's name ____________________ Nick name ________________

Address ____

Birth date ____________________ Telephone ________________

Age now: years ____ months ____

Parents: Living together ☐ Divorced ☐ Separated ☐

Mother's name ____________________ Amt. of education ____________

Birth place ____________________ Place of business ____________

Birth date ____________________ Nature of work ______________

Father's name ____________________ Amt. of education ____________

Birth place ____________________ Place of business ____________

Birth date ____________________ Nature of work ______________

Brothers:

name	birth date	school	grade

Sisters:

____

____

____

Child's previous group experience: (please include any play group, Sunday School, nursery school)

How long have you lived at this address? ________________________

Have you moved during this child's life time?___ How many times?_____

Others living in the home (aunts, uncles, grandparents, etc.) ______

____

APPLICATION--continued

Who takes care of the child?

Mother ☐ Grandmother ☐ Babysitter ☐ Other ☐

Language spoken in the home:

English only ☐ Mostly English but some Spanish ☐

Spanish only ☐ Mostly Spanish but some English ☐

Other ____________________

Child born: In California In another state In another country

I understand that this form is not an enrollment form. Rather, it is an indication of my interest in the preschool educational program and my willingness to have my child attend a preschool class if he/she is selected.

____

Signature of Parent

APPENDIX B

FREMONT UNIFIED SCHOOL DISTRICT
611 Olive Avenue · Fremont, California · 94538
Phone 657-2350 Area Code 415

Dr. William J. Bolt
District
Superintendent

August 10, 1966

Two preschool classes will be conducted in Fremont Unified School District from September 6, 1966 to June 30, 1967. Three-year-olds and four-year-olds in families receiving AFDC (Aid to Families with Dependent Children) in Newark and Fremont are eligible for these classes. Because this program will be on a trial basis for the first year only 40 children can be accommodated. Every eligible child whose parent has filled out an application will receive the same chance as any other eligible child to be assigned to a preschool class. If the program proves successful during the coming year funds may be made available in later years for all eligible preschool children.

If you are interested in such a program for please fill out the enclosed application. Representatives of Fremont Unified School District will call at your home soon to answer any questions you may have and to pick up the application. Please call me if you wish further information (657-3956).

Sincerely,

Barbara Vance
Supervisor
Preschool Educational Programs

BV:ao

Encl.

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APPENDIX C

CAIN-LEVINE SOCIAL COMPETENCY SCALE*

Social Skills (SS)

13. TABLE SETTING

    1. Does not place silver, plates, cups, etc. on table.
    2. Simply places silver, plates, cups, etc. on table.
    3. Simply places items around table, not necessarily where they belong.
    4. Places plates, glasses, and utensils in positions he has learned.
    5. Places all eating utensils, napkins, salt, pepper, sugar, etc. in positions he has learned.

19. ATTENDING TO TASKS Child will pay attention to task (e.g., cleaning up, putting things away):

    1. If time does not exceed five minutes.
    2. If time does not exceed ten minutes.
    3. If time does not exceed fifteen minutes.
    4. Even if time exceeds fifteen minutes.

25. GOING ON ERRANDS

    1. Cannot be sent on errands to other people.
    2. Can be sent on errands with note to other people.
    3. Can be sent on errands without note if only one object is desired.
    4. Can be sent on errands without note if no more than two objects are desired.

26. FREEDOM OF MOVEMENT

    1. Does not go out of house or yard alone.
    2. Goes out alone in the immediate area of the house.
    3. Goes freely on his own block.
    4. Goes several blocks alone.

27. ANSWERING TELEPHONE

    1. Cannot answer telephone.
    2. Answers telephone, but unable to take message and/or call appropriate person.

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*Published by Consulting Psychologists Press, Palo Alto, Calif.

(ANSWERING TELEPHONE)

3. Answers telephone, calls appropriate person. Cannot take message.
4. Answers telephone, calls appropriate person and takes message.

28. SHARING

1. Does not share toys with other children.
2. Sometimes shares toys with other children.
3. Usually shares toys with other children.
4. Nearly always shares toys with other children.

29. BORROWING

1. Frequently takes objects when in use by others.
2. Takes others' objects when not in use.
3. Sometimes asks permission to use others' objects.
4. Usually asks permission to use others' objects.
5. Nearly always asks permission to use others' objects.

30. RETURNING PROPERTY When he has borrowed something he:

1. Rarely, if ever, returns property to owner.
2. Sometimes returns property to owner.
3. Usually returns property to owner.
4. Nearly always returns property to owner.

31. PLAYING WITH OTHERS

1. Usually plays by self.
2. Plays with others but limits play to one or two children.
3. Occasionally plays with a larger group (three or more children).
4. Usually plays with a larger group (three or more children).

34. HELPING OTHERS

1. Never helps other children.
2. Helps another child only when they are playing together
3. Sometimes stops his own play to help another child.
4. Usually stops his own play to help another child.

Initiative (I)

3. INITIATING DRESSING

1. Does not initiate dressing.
2. Occasionally initiates dressing.
3. Frequently initiates dressing.
4. Nearly always initiates dressing.

8. KEEPING NOSE CLEAN

1. Does not keep nose clean.
2. Occasionally cleans nose.
3. Frequently cleans nose.
4. Nearly always cleans nose.

9. TOILETING

1. Does not wipe self.
2. Occasionally wipes self.
3. Frequently wipes self.
4. Nearly always wipes self.

16. CLEANING UP MESS

1. Does not take initiative in cleaning up own mess.
2. Occasionally takes initiative in cleaning up own mess.
3. Frequently takes initiative in cleaning up own mess.
4. Nearly always takes initiative in cleaning up own mess.

17. REPORTING ACCIDENTS

1. Does not report accidents (e.g., spilling, breaking, etc.).
2. Occasionally reports accidents.
3. Frequently reports accidents.
4. Nearly always reports accidents.

18. COMPLETING TASKS When given responsibility for a task (e.g., picking up, cleaning room) he:

1. Does not do task without being reminded.
2. Occasionally does task without being reminded.
3. Frequently does task without being reminded.
4. Nearly always does task without being reminded.

23. PUTTING TOYS AWAY

1. Puts toys away only when directed to do so.
2. Occasionally puts toys away without being told.
3. Frequently puts toys away without being told.
4. Nearly always puts toys away without being told.

24. HANGING UP CLOTHES

1. Does not hang up clothes without being told.
2. Occasionally hangs up clothes without being told.
3. Frequently hangs up clothes without being told.
4. Nearly always hangs up clothes without being told.

32. INITIATING PLAY

1. Does not seek other children to play with.
2. Occasionally seeks other children to play with.
3. Frequently seeks other children to play with.
4. Nearly always seeks other children to play with.

33. OFFERING ASSISTANCE

1. Does not offer assistance to others.
2. Occasionally offers assistance to others.
3. Frequently offers assistance to others.
4. Nearly always offers assistance to others.

Self-Help (SH)

1. DRESSING

1. Cannot put on any clothing.
2. Can put on most clothing, can zip, cannot button.
3. Can put on most clothing, can zip and button.
4. Completely dresses self, except for shoe tying.
5. Completely dresses self, including shoe tying.

2. TYING SHOE LACES

1. Cannot pull laces tight.
2. Can pull laces tight.
3. Can make first part of the knot.
4. Can tie bow.

4. UNDRESSING

1. Cannot remove any clothing.
2. Takes off most clothing, can unzip, but cannot unbutton.
3. Takes off most clothing, can unzip and unbutton.
4. Completely undresses self.

5. CARE OF SHOES

1. Cannot wipe shoes.
2. Can wipe shoes, but cannot brush or polish.
3. Can wipe and brush shoes, but cannot polish.
4. Can clean, brush and polish shoes.

6. WASHING HANDS AND FACE

1. Cannot wash hands or face.
2. Partially washes hands and face; needs help in finishing.
3. Washes hands and face, but needs to be checked each time.
4. Washes hands and face and sometimes needs to be checked.
5. Washes hands and face and does not have to be checked.

7. BRUSHING TEETH
    1. Cannot brush teeth.
    2. Makes brushing motions, but does not brush adequately.
    3. Brushes teeth adequately, but cannot apply paste.
    4. Applies paste and brushes teeth adequately.

10. USE OF UTENSILS
    1. Cannot use utensils in feeding self.
    2. Feeds self only with spoon.
    3. Feeds self with fork.
    4. Uses spoon and fork and can cut with knife in eating.

11. USE OF KNIFE
    1. Cannot use knife in eating.
    2. Spreads butter, jam, etc., with knife.
    3. Cuts soft foods, such as meat patties, French toast, etc.
    4. Cuts meat, if removed from bone.

12. FOOD PREPARATION
    1. Cannot prepare simple foods.
    2. Prepares sandwiches not requiring spreading, such as cold cuts, cheese, etc.
    3. Prepares sandwiches requiring spreading such as peanut butter, cheese spread, etc.
    4. Prepares food requiring mixing, such as cold puddings, cold drinks, etc.
    5. Prepares foods requiring cooking, such as jello, oatmeal, etc.

14. CLEARING TABLE
    1. Cannot clear table.
    2. Clears table of unbreakable dishes and silverware.
    3. Clears table of breakable dishes and glassware.
    4. Clears table, scrapes and stacks breakable dishes for washing.

15. CLEANING UP LIQUIDS
    1. When cleaning up spilled liquids he smears over larger area, making bigger mess.
    2. Blots up some liquid, but job must be completed by someone else.
    3. Blots up liquid area, but requires finishing touches by someone else.
    4. Cleans up liquid and does not require someone to finish job.

20. MAKING BED

    1. Cannot make or undo bed.
    2. Can undo but cannot make bed.
    3. Can spread sheets and blankets on bed, but cannot tuck or put pillow in case.
    4. Can completely make bed, including tucking and putting pillow in case.

21. SWEEPING

    1. Cannot sweep floor.
    2. Sweeps floor where there is no furniture, but is unable to pick up dirt in dust pan.
    3. Sweeps floor where there is no furniture, and can pick up dirt in dust pan.
    4. Sweeps under furniture, such as tables and chairs, and can pick up dirt in dust pan.

22. FOLDING ARTICLES

    1. Cannot fold any articles.
    2. Can fold washcloths, towels and pillow cases with help.
    3. Can fold washcloths, towels and pillow cases without help.
    4. Can fold washcloths, towels and pillow cases without help, and sheets, blankets and bedspreads with help.
    5. Can fold all of above items without help.

Communication (C)

35. USE OF LANGUAGE

    1. Says no words--gestures only.
    2. Speaks incomplete sentences.
    3. Speaks in complete sentences.
    4. Speaks in more complex sentences, connecting a number of actions or statements.

36. CLARITY OF SPEECH

    1. Communicates by gesture only.
    2. Can speak, but speech is frequently indistinct.
    3. Speech is somewhat clear but occasionally indistinct.
    4. Speech is generally clear and distinct.

37. UNDERSTANDABLE SPEECH

    1. Cannot be understood by anyone.
    2. Can be understood by immediate family only.
    3. Can be understood by neighbors and friends.
    4. Can be understood by most people.

38. IDENTIFICATION

    1. Cannot state first name.
    2. Can state first name only.
    3. Can state full name.
    4. Can state full name and address.

39. REPEATING WORDS

    1. Cannot repeat sounds or words made by others.
    2. Can repeat most sounds made by others.
    3. Can repeat most words made by others.
    4. Can repeat complete sentences made by others.

40. INDICATING WANTS

    1. Does not indicate, even by gesture, that he wants someone to share something with him.
    2. Indicates by gesture and limited speech but does not name object (i.e., "I want," "Give me").
    3. Indicates that he wants someone to share with him by naming objects.
    4. Uses complete sentence to express his desire for someone to share with him.

41. ANSWERING QUESTIONS When asked a question he:

    1. Does not respond.
    2. Responds by nodding, pointing or other gesture.
    3. Verbally answers question, but with incomplete sentence.
    4. Verbally answers question with complete sentence.

42. ANSWERING DOOR

    1. Does not gesture or speak, just stands there.
    2. Indicates that someone is at door by gesture only.
    3. Indicates that someone is at door by using incomplete sentence.
    4. Indicates that someone is at door by using complete sentence.

43. DELIVERING MESSAGES

    1. Cannot deliver messages by gesture or other means.
    2. Can deliver a simple message by gesture only.
    3. Can deliver a simple message verbally.
    4. Can deliver a more complex message verbally (more than one thought or activity).

44. RELATING OBJECTS TO ACTION

    1. Cannot name objects in pictures or story books.
    2. Can name objects and people in pictures but cannot indicate actions.
    3. Can relate objects to action but unable to connect actions into a story.
    4. Can connect actions in a picture to tell a story.

APPENDIX D

VANCE LANGUAGE SKILLS TEST
(Preliminary Form)

Score Sheet

Labeling Subtest (Production)
(based on Form B, Peabody Picture Vocabulary Test)

1. table ____________________
2. bus ____________________
3. horse ____________________
4. dog ____________________
5. shoe ____________________
6. finger ____________________
7. boat ____________________
8. children ____________________
9. bell ____________________
10. turtle ____________________
11. climbing ____________________
12. lamp ____________________
13. sitting ____________________
14. jacket ____________________
15. pulling ____________________
16. ring ____________________
17. nail ____________________
18. hitting ____________________
19. tire ____________________
20. ladder ____________________
21. snake ____________________
22. river ____________________
23. ringing ____________________
24. baking ____________________
25. cone ____________________
26. engineer ____________________
27. peeking ____________________
28. kite ____________________
29. rat ____________________
30. time ____________________
31. sail ____________________
32. ambulance ____________________
33. trunk ____________________
34. skiing ____________________
35. hook ____________________
36. tweezers ____________________
37. wasp ____________________
38. barber ____________________
39. parachute ____________________
40. saddle ____________________
41. temperature ____________________
42. captain ____________________
43. whale ____________________
44. cash ____________________
45. balancing ____________________
46. cobweb ____________________
47. pledging ____________________
48. argument ____________________
49. hydrant ____________________
50. binocular ____________________
51. locomotive ____________________
52. hive ____________________
53. reel ____________________
54. insect ____________________
55. gnawing ____________________
56. weapon ____________________
57. bannister ____________________
58. idol ____________________
59. glove ____________________
60. walrus ____________________
61. filing ____________________
62. shears ____________________
63. horror ____________________
64. chef ____________________
65. harvesting ____________________
66. construction ____________________
67. observatory ____________________
68. assistance ____________________
69. erecting ____________________
70. thoroughbred ____________________
71. casserole ____________________
72. ornament ____________________
73. cobbler ____________________
74. autumn ____________________
75. dissatisfaction ____________________
76. scholar ____________________
77. oasis ____________________
78. soldering ____________________
79. astonishment ____________________
80. tread ____________________
81. thatched ____________________
82. jurisprudence ____________________
83. sapling ____________________
84. arch ____________________
85. dwelling ____________________
86. lubricating ____________________

Score sheet

Sound Discrimination Subtest (Comprehension)
(Templin-1957)

1. keys - peas ____
2. chairs - stairs ____
3. mouse - mouth ____
4. dish - fish ____
5. bell - ball ____
6. pin - pig ____
7. clocks - blocks ____
8. bat - bath ____
9. sail - pail ____
10. card - car ____
11. bread - red ____
12. peach - peas ____
13. seat - feet ____
14. bag - back ____
15. horn - corn ____
16. stone - stove ____
17. gum - drum ____
18. nail - mail ____
19. box - blocks ____
20. coat - goat ____
21. star - car ____
22. bread - bed ____
23. pan - pin ____
24. back - bat ____
25. grass - glass ____
26. clown - cloud ____
27. pail - nail ____
28. cap - cup ____
29. rake - lake ____
30. blocks - socks ____
31. thread - sled ____
32. string - spring ____
33. back - black ____
34. sleep - sweep ____
35. cat - cap ____
36. tie - pie ____
37. beads - beans ____
38. tail - pail ____
39. soup - soap ____
40. ship - chip ____
41. lamp - lamb ____
42. nose - toes ____
43. thread - spread ____
44. cone - comb ____
45. string - ring ____
46. hat - cat ____
47. pipe - pie ____
48. beets - beads ____
49. horse - house ____
50. cane - can ____
51. gum - gun ____
52. train - rain ____
53. bread - thread ____
54. ring - rim ____
55. tree - three ____
56. swing - string ____
57. cone - coat ____
58. bread - spread ____
59. hand - sand ____

Score sheet

Environmental Sound Identification Subtest
(Comprehension)
(after Institute of Developmental Studies, 1966)

Example A: ball ___ *telephone* ___ car ___ ship ___

Example B: lamb ___ kitten ___ *dog barking* ___ pig ___

1. thunder ___ *airplane* ___ baby crying ___ cow ___
2. *glass breaking* ___ sheep ___ airplane ___ vacuum cleaner ___
3. blocks falling ___ children playing ___ vacuum cleaner ___ *thunder* ___
4. fire engine ___ kitten ___ sheep ___ *train* ___
5. ball bouncing ___ knocking on door ___ *typewriter* ___ water pouring into sink ___
6. train ___ kitten ___ blocks falling ___ *fire engine* ___
7. *baby crying* ___ airplane ___ fire engine ___ children playing ___
8. airplane ___ *birds* ___ typewriter ___ knocking on door ___
9. paper crumpling ___ fire engine ___ *blocks falling* ___ children playing ___
10. baby crying ___ thunder ___ blocks falling ___ *cow* ___
11. *children playing* ___ fire engine ___ ball bouncing ___ kitten ___
12. ball bouncing ___ kitten ___ *sheep* ___ knocking on door ___
13. airplane ___ *water pouring into sink* ___ kitten ___ cow ___
14. fire engine ___ *kitten* ___ ball bouncing ___ sheep ___
15. knocking on door ___ *cash register* ___ baby crying ___ cow ___

__Environmental Sound Identification__
__Subtest__ (Comprehension)--continued

16. __vacuum cleaner__ ___ train ___ typewriter ___ kitten ___
17. kitten ___ knocking on door ___ vacuum cleaner ___ __eating an apple__ ___
18. __knocking on door__ ___ ball bouncing ___ typewriter ___ eating an apple ___
19. birds ___ airplane ___ typewriter ___ __paper crumpling__ ___
20. __ball bouncing__ ___ birds ___ kitten ___ eating an apple ___

Score sheet

Environmental Sound Labeling Subtest
(Production)
(after Institute of Developmental Studies, 1966)

Examples: dog barking
telephone ringing

1. cars in traffic, bus stopping: ______________________
2. sneeze: ______________________
3. door creaking: ______________________
4. telephone busy signal: ______________________
5. radio (baseball game): ______________________
6. kittens and cats: ______________________
7. sawing wood: ______________________
8. horse neighing: ______________________
9. thunder: ______________________
10. walking on steps: ______________________
11. bell: ______________________
12. hammering: ______________________
13. humming: ______________________
14. water running in sink: ______________________
15. woman laughing: ______________________
16. whistling: ______________________
17. clock ticking: ______________________
18. woman talking: ______________________
19. piano playing: ______________________

Score sheet

Spatial Relations Subtest A
(Comprehension)

Example A: pea at side of spoon ___ pea under spoon ___ pea in spoon ___ pea behind spoon ___

1. ball on the box ___ ball in the box ___ ball at side of box ___ ball behind box ___
2. clouds under airplane ___ clouds behind airplane ___ clouds above airplane ___ clouds in front of airplane ___
3. an apple and a pear behind the basket ___ an apple and a pear in basket ___ an apple and a pear at side of basket ___ an apple and a pear in front of basket ___
4. leaves in basket ___ leaves at side of basket ___ leaves under basket ___ leaves on basket (basket turned over) ___
5. glasses and plates all on one side of tablecloth ___ glasses on one side and plates on other side of tablecloth ___ glasses and plates in middle of tablecloth ___ glasses at back of tablecloth and plates at front of tablecloth ___
6. pencil under paper ___ pencil on paper ___ pencil at side of paper ___ pencil in front of paper ___
7. fire truck behind station ___ fire truck in station ___ fire truck at side of station ___ fire truck in front of station ___

Score sheet

Spatial Relations Subtest B
(Production)
(after Caldwell, 1965)

Materials: 3 toy cars, same size and color
3 boxes, same color, one small, one medium, one large

1. Put a car on a box.

____

2. Put a car under a box.

____

3. Put a car on the little box.

____

4. Put a car in the middle-sized box.

____

5. Put all the cars on one side of the table. Put all the boxes on the other side of the table.

____

6. Put a car behind the middle-sized box.

____

7. Put all the cars in the big box.

____

8. Give everything to me.

____

Score sheet

Concept Identification Subtest

(Comprehension and Production)
(after Ametjian, 1965, and Institute of
Developmental Studies, 1966)

Example A: dog ___ chair ___ *apple ___ ball ___

____

Example B: pencil ___ glass ___ lamp ___ *slice of bread ___

____

1. *swing ___ football ___ pear ___ spoon ___

____

2. bee ___ wagon ___ apple ___ *cup and saucer ___

____

3. milk carton ___ *doll ___ roller skate ___ green beans ___

____

4. electric train on track ___ duck ___ van truck ___ *hammer ___

____

5. two boy scouts ___ *truck hauling cars ___ lion ___ gingerbread man ___ ____

6. automatic washing machine ___ camel ___ elephant ___ *clown ___

____

7. doll ___ half grapefruit on saucer ___ girl in raincoat ___ *bowl of hot soup with spoon ___

____

8. bathtub ___ baby birds in nest ___ candy ___ *celery ___

____

9. girl in swing ___ circus people ___ *monkeys ___ plate on checked tablecloth ___ ____

10. painting easel ___ canary ___ *alarm clock ___ garbage can ___

____

Score sheet

Concept Similarity Subtest
(Comprehension and Production)
(After Ametjian, 1965, and Institute of Developmental Studies, 1966)

Example A: apple ___ glass ___ *chair ___ pencil ___

____

Example B: *dog ___ lamp ___ ball ___ slice of bread ___

____

1. bouquet of flowers ___ dump truck ___ clump grapes ___ *ball ___

   ____

2. *puzzle ___ apron ___ three apples on a plate ___ policeman ___

   ____

3. woman in muffler and coat ___ airplane ___ *girls playing hopscotch ___ bear ___ ____

4. frog ___ American flag ___ *wall telephone ___ crane ___

   ____

5. sailor ___ *baby rabbits ___ girl with umbrella ___ classroom with desks ___ ____

6. dog ___ violin ___ table with watermelon ___ *boy on tricycle ___

   ____

7. cow ___ toy tiger ___ *lettuce ___ fire engine ___

   ____

8. bouncing ball ___ *tea kettle ___ kittens ___ bell ___

   ____

9. dolly pram ___ *man in parachute ___ gloves ___ ice cream soda ___ ____

10. bear ___ egg in bird nest ___ *bridge over river ___ dress ___

    ____

Score sheet

Concept Specificity Subtest
(Comprehension and Production)
(after Ametjian, 1965, and Institute of
Developmental Studies, 1966)

Example A: *table ___ piece of cake ___ ball ___ *chair ___

____

Example B: doll ___ *dog ___ slice of bread ___ *cat ___

____

1. *airplane ___ saw ___ *train ___ spoon ___

   ____

2. *butter ___ sled ___ *cheese ___ hammer ___

   ____

3. *moon ___ *star ___ dress ___ dollhouse ___

   ____

4. radishes ___ *robin ___ mixmaster ___ *canary ___

   ____

5. fire hydrant ___ *baseball ___ hen ___ *football ___

   ____

6. *liner ___ doctor with boy ___ house ___ *sailboat ___

   ____

7. Christmas tree ___ *sailor ___ classroom with desks ___
   *soldier ___ _______________________________________

8. *telephone ___ boy and girl in snow and on sled ___ man shaving___
   *telephone booth ___

   ____

VLST
Score Sheet

APPENDIX E

Vance Language Skills Test
Labeling
(from Form B, Peabody Picture Vocabulary Test)
Subtest No. I (Production)

Name____________________Age___Sex___Address____________________

Time_____Duration of Test______Examiner_______________Date______

Total 2 pts.___Total 1 pt.___ Grand Total Correct _____ Nouns Correct _____ Verbs Correct _____

Example A: What is this?
Sock (N) __________

Example B: What is this baby doing?
Sleeping (V) __________

__ 1. What is this?
table (N) ___________

__ 2. What is this?
stairs (N) ___________

__ 3. What is this?
scissors (N) __________

__ 4. What is this?
ring (N) _____________

__ 5. What is this?
ladder (N) ___________

__ 6. What is this girl doing?
sitting (V) __________

__ 7. What is this boy doing?
ringing (V) __________

__ 8. What is this?
bus (N) ______________

__ 9. What is this?
nail (N) ______________

__10. What is this boy doing?
hammering (V) _________

__11. What is this?
kite (N) ______________

__12. What is this boy doing?
climbing (V) __________

__13. What is this?
lamp (N) ______________

__14. What is this?
tire (N) ______________

VLST Subtest No. I: Labeling (continued)

__ 15. What are these men doing?

arguing (V) ___________

__ 16. What is this?

children (N) __________

__ 17. What is this?

jacket (N) ____________

__ 18. What is this girl doing?

hiding (V) ____________

__ 19. What do you do with this?

time (N) ______________

__ 20. What is this?

necklace (N) __________

__ 21. What is this?

money (N) _____________

__ 22. What is this?

spider web (N) ________

__ 23. What is this girl doing?

pulling (V) ____________

__ 24. What is this girl doing?

baking (V) _____________

__ 25. What is this?

globe (N) ______________

__ 26. What is the man in this picture?

barber (N) _____________

__ 27. What is this?

bowl (N) _______________

__ 28. What is this?

hydrant (N) ____________

__ 29. What is the man in this picture?

shoemaker (N) __________

__ 30. What is this?

saddle (N) _____________

VLST
Score Sheet

Vance Language Skills Test
Spatial Relations A
Subtest No. II (Comprehension)

Score (No. correct) _______

Example: chair behind table ___ chair in front of table ___
chair at side of table ___ chair on top of table ___

1. ball on the box ___ ball in the box ___ ball at the side of the box ___ ball behind the box ___
2. an apple and a pear behind the basket ___ an apple and a pear in the basket ___ an apple and a pear at the side of the basket ___ an apple and a pear in front of the basket ___
3. leaves in a basket ___ leaves at the side of a basket ___ leaves under a basket ___ leaves on basket (basket turned over) ___
4. glasses and plates on one side of the table ___ glasses on one side and plates on the other side of the table ___ glasses and plates in the middle of the table ___ glasses at the back of the table and plates at the front of the table ___
5. fire truck behind the fire station ___ fire truck in the fire station ___ fire truck at the side of the fire station ___ fire truck in front of the station ___

VLST
Score Sheet

Vance Language Skills Test
Environmental Sound Identification
Subtest No. III (Comprehension)

Score (No. correct) ________

Example A: lamb ___ kitten ___ dog ___ pig ___

1. thunder ___ airplane ___ baby crying ___ cow ___
2. glass breaking ___ sheep ___ airplane ___ vacuum cleaner ___
3. fire engine ___ kitten ___ sheep ___ train ___
4. blocks falling ___ fire engine ___ vacuum cleaner ___ thunder ___
5. baby crying ___ airplane ___ fire engine ___ children ___
6. paper crumpling ___ fire engine ___ blocks falling ___ children playing ___
7. vacuum cleaner ___ train ___ typewriter ___ kitten ___
8. kitten ___ knocking on door ___ vacuum cleaner ___ eating an apple ___
9. ball bouncing ___ knocking on door ___ typewriter ___ eating an apple ___
10. ball bouncing ___ birds ___ kitten ___ eating an apple ___
11. bell ___ telephone ___ car ___ ship ___

VLST
Score Sheet

Vance Language Skills Test
Speech Sound Discrimination
(Templin)
Subtest No. IV (Comprehension)

Score (No. correct) ______

1. *keys* - peas ______
2. *chairs* - stairs ______
3. mouse - *mouth* ______
4. *dish* - fish ______
5. bell - *ball* ______
6. pin - *pig* ______
7. clocks - *blocks* ______
8. bat - *bath* ______
9. *sail* - pail ______
10. *card* - car ______
11. bread - *red* ______
12. *peach* - peas ______
13. *seat* - feet ______
14. bag - *back* ______
15. horn - *corn* ______
16. *stone* - stove ______
17. gun - *drum* ______
18. *nail* - mail ______
19. *box* - blocks ______
20. *coat* - goat
21. star - *car* ______
22. *bread* - bed ______
23. pen - *pin* ______
24. back - *bat* ______
25. *grass* - glass ______
26. *clown* - cloud ______
27. pail - *nail* ______
28. *cap* - cup ______
29. *rake* - lake ______
30. *blocks* - socks ______
31. thread - *sled* ______
32. string - *spring* ______
33. back - *black* ______
34. sleep - *sweep* ______
35. *cat* - cap ______
36. tie - *pie* ______
37. *beads* - beans ______
38. *tail* - pail ______
39. *soup* - soap ______
40. ship - *chip* ______

VLST Subtest No. IV:
Speech Sound Discrimination (continued)

41. *lamp* - lamb ______
42. nose - *toes* ______
43. thread - *spread* ______
44. *cone* - comb ______
45. *string* - ring ______
46. hat - *cat* ______
47. pipe - *pie* ______
48. beets - *beads* ______
49. *horse* - house ______
50. *cane* - can ______
51. gum - *gun* ______
52. train - *rain* ______
53. *bread* - thread ______
54. *ring* - rim ______
55. tree - *three* ______
56. swing - *string* ______
57. *cone* - coat ______
58. *bread* - spread ______
59. hand - *sand* ______

VLST
Score Sheet

Vance Language Skills Test
Spatial Relations B
Subtest No. V (Production)

Score (No. correct) ________

___ 1. Put the block on top of the box ______________________

___ 2. Put the block at the side of the box ______________________

___ 3. Put the block inside the box ______________________

___ 4. Put the block in back of the box ______________________

___ 5. Put the block on the box ______________________

___ 6. Put the block beside the box ______________________

___ 7. Put the block behind the box ______________________

___ 8. Put the block in front of the box ______________________

___ 9. Put the block under the box ______________________

___ 10. Put the block above the box ______________________

VLST
Score Sheet

Vance Language Skills Test
Environmental Sound Labeling
Subtest No. VI (Production)

Total 1 pt. ______ Total 2 pts. ______ Grand Total Correct ____

Example: dog barking ________________________________

___ 1. sneeze ________________________________

___ 2. door squeaking ________________________________

___ 3. telephone busy signal ________________________

___ 4. sawing ________________________________

___ 5. walking on steps ____________________________

___ 6. bells ________________________________

___ 7. hammering ________________________________

___ 8. humming ________________________________

___ 9. whistling ________________________________

___ 10. piano ________________________________

VLST
Score Sheet

Vance Language Skills Test
Percepts and Concepts
Subtest No. VII (Comprehension and Production)

Score:

Total correct picture choices ___ Total 2 pts. "Just exactly alike" ___

Total 1 pt. "Just exactly alike" ___ Total 2 pts. "Same kind of thing" ___

Total 1 pt. "Same kind of thing" ___ Grand total correct ___

Example A: roller skate ___ chair ___ *apple ___ football ___ *apple ___

*   Just exactly alike
      Same kind of thing

Example B: *furry dog ___ lamp on desk ___ traffic light ___

*furless dog ___ wagon ___

      Just exactly alike
*   Same kind of thing

1. *clown ___ washing machine ___ camel ___ elephant ___ *clown ___

*   Just exactly alike
      Same kind of thing

2. flowers ___ *football ___ dump truck ___ grapes ___ *basketball ___

      Just exactly alike
*   Same kind of thing

3. *monkeys ___ girl in swing ___ circus people ___ *monkeys ___

table ___

*   Just exactly alike
      Same kind of thing

4. *doll ___ milk carton ___ *doll ___ roller skate ___

string beans ___

*   Just exactly alike
      Same kind of thing

VLST Subtest No. VIII:
Percepts and Concepts (continued)

5. oriental doll ___ *bowl of hot soup ___ half grapefruit ___ girl in raincoat ___ *bowl of hot soup ___

* Just exactly alike
Same kind of thing

6. radishes ___ *robin ___ mixmaster ___ *canary ___ loaf of bread ___

Just exactly alike
* Same kind of thing

7. *bridge with arch ___ bear ___ bird in nest ___ *bridge with railing ___ dress on hanger ___

Just exactly alike
* Same kind of thing

8. 2 boy scouts ___ *car carrier ___ lion ___ gingerbread man ___ *car carrier ___

* Just exactly alike
Same kind of thing

9. *desk telephone ___ frog ___ flag ___ *wall telephone ___ crane ___

Just exactly alike
* Same kind of thing

VLST
Instruction Sheet

Vance Language Skills Test
Language Structure and Content
Subtest No. VIII (Production)

QUESTIONS:

State into recorder THIS IS AN INTERVIEW BETWEEN (Examiner's Name) and (Child's name) .

1. TELL ME WHO YOU PLAY WITH, (Child's name) .
2. WHAT DO YOU PLAY WITH (Name of playmate(s) ?
   - a) TELL ME ABOUT THAT GAME (THOSE GAMES) YOU PLAY WITH (Name of playmate(s) .
3. DO YOU LIKE TELEVISION?
   - a) WHAT PROGRAMS DO YOU LIKE BEST?
   - b) TELL ME ABOUT THE (OR THAT ONE).
4. HAVE YOU EVER BEEN SICK?
   - a) TELL ME ABOUT THAT.
5. WHAT DO YOU LIKE TO DO BEST OF EVERYTHING IN THE WHOLE WORLD?

PICTURES:

NOW, I'M GOING TO SHOW YOU SOME PICTURES. I WANT YOU TO TELL ME ALL ABOUT THE PICTURES. WILL YOU DO THAT?

(Ask only the questions that are indicated here. If a child's first response to the picture covers the area of one of the sub questions, omit the sub question.)

1. THIS IS PICTURE NUMBER ONE (small boy running and crying, a dog, and two small girls watching him; part of a woman in the picture). TELL ME ALL ABOUT THIS PICTURE.
   - a) TELL ME WHAT YOU SEE IN THE PICTURE.
   - b) TELL ME A STORY ABOUT THE PICTURE. PRETEND A STORY.
   - c) WHY IS THE LITTLE BOY CRYING?

VLST Subtest No. VIII:
Language Structure and Content (continued)

2. THIS IS PICTURE NUMBER TWO (little girl holding a rabbit inside small wire enclosure). TELL ME ALL ABOUT THIS PICTURE.
   a) TELL ME WHAT YOU SEE IN THE PICTURE.
   b) TELL ME A STORY ABOUT THE PICTURE. PRETEND A STORY.
   c) WHY IS THE LITTLE GIRL PICKING UP THE RABBIT?

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